Series PD

User's Manual

Ethernet-Enabled Temperature/Process Controller

CE

TOTAL CUSTOMER SATISFACTION 3 Year Warranty

ISO 9001 Registered Company Winona, Minnesota USA

WATLOW

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Made in the U.S.A.

$15.00

Safety Information

We use note, caution and warning symbols throughout this book to draw your attention to important operational and safety information.

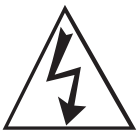
A “NOTE” marks a short message to alert you to an important detail.

A “CAUTION” safety alert appears with information that is important for protecting your equipment and performance. Be especially careful to read and follow all cautions that apply to your application.

CAUTION or WARNING

A “WARNING” safety alert appears with information that is important for protecting you, others and equipment from damage. Pay very close attention to all warnings that apply to your application.

The safety alert symbol, ⚠ (an exclamation point in a triangle) precedes a general CAUTION or WARNING statement.



Electrical Shock Hazard

CAUTION or WARNING

The electrical hazard symbol, ⚠ (a lightning bolt in a triangle) precedes an electric shock hazard CAUTION or WARNING safety statement.

Technical Assistance

If you encounter a problem with your Watlow controller, review your configuration information to verify that your selections are consistent with your application: inputs, outputs, alarms, limits, etc. If the problem persists, you can get technical assistance from your local Watlow representative (see back cover), by e-mailing your questions to wintechsupport@watlow.com or by dialing +1 (507) 494-5656 between 7 a.m. and 5 p.m., Central Standard Time (CST). Ask for for an Applications Engineer. Please have the following information available when calling:

- Complete model number
- Quick Start Guide or User’s Manual
- All Series PD configuration information
- Computer Hardware / Software Configuration

Warranty

The Series PD is manufactured by ISO 9001-registered processes and is backed by a three-year warranty.

Return Material Authorization (RMA)

1. Call Watlow Customer Service, (507) 454-5300, for a Return Material Authorization (RMA) number before returning any item for repair. We need this information:
   - Ship to address
   - Bill to address
   - Contact name
   - Phone number
   - Method of return shipment
   - Your P.O. number
   - Detailed description of the problem
   - Any special instructions
   - Name and phone number of person returning the product.
2. Prior approval and an RMA number, from the Customer Service Department, is needed when returning any unused product for credit. Make sure the RMA number is on the outside of the carton, and on all paperwork returned. Ship on a Freight Prepaid basis.
3. After we receive your return, we will examine the unit and try to verify the reason for the return.
4. In cases of manufacturing defect, we will enter a repair order, replacement order or issue credit for material returned.
5. To return products that are not defective, goods must be be in new condition, in the original boxes and they must be returned within 120 days of receipt. A 20 percent restocking charge is applied for all returned stock controls and accessories.
6. If the unit is unrepairable, it will be returned to you with a letter of explanation.
7. Watlow reserves the right to charge for no trouble found (NTF) returns.

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1 Overview

The Series PD controller is a DIN rail mounted, general purpose industrial PID temperature/process controller. The Series PD is available in single and dual channel versions and features an embedded web server to provide an easy to use interface for configuration and monitoring of processes. The controller also features several popular communications protocols to facilitate easy integration into most existing process management systems.

The Series PD accepts thermocouple, RTD and process signal control inputs and also features auxiliary digital inputs or optional current transformer (CT) inputs. Up to four control or event (alarm) outputs can be selected on either the single or dual channel versions.

Advanced features of the Series PD controllers include internal datalogging of key control parameters, INFOSENSE-P™ sensor technology, heater burn out detection and an enhanced control algorithm.

The SERIES PD controller is backed by a three-year warranty from Watlow Winona and is UL® 508, C-UL®, CSA and CE approved.

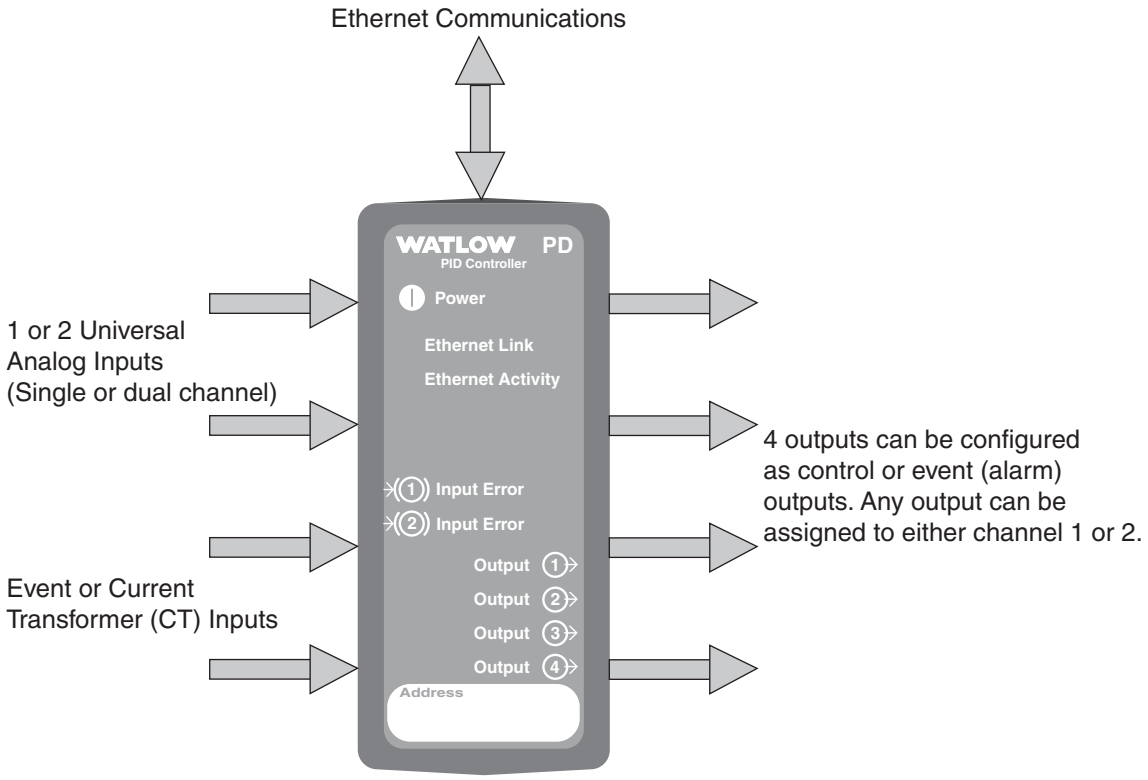


Figure 2 — Series PD inputs and outputs.

2 Install and Wire

Series PD Dimensions

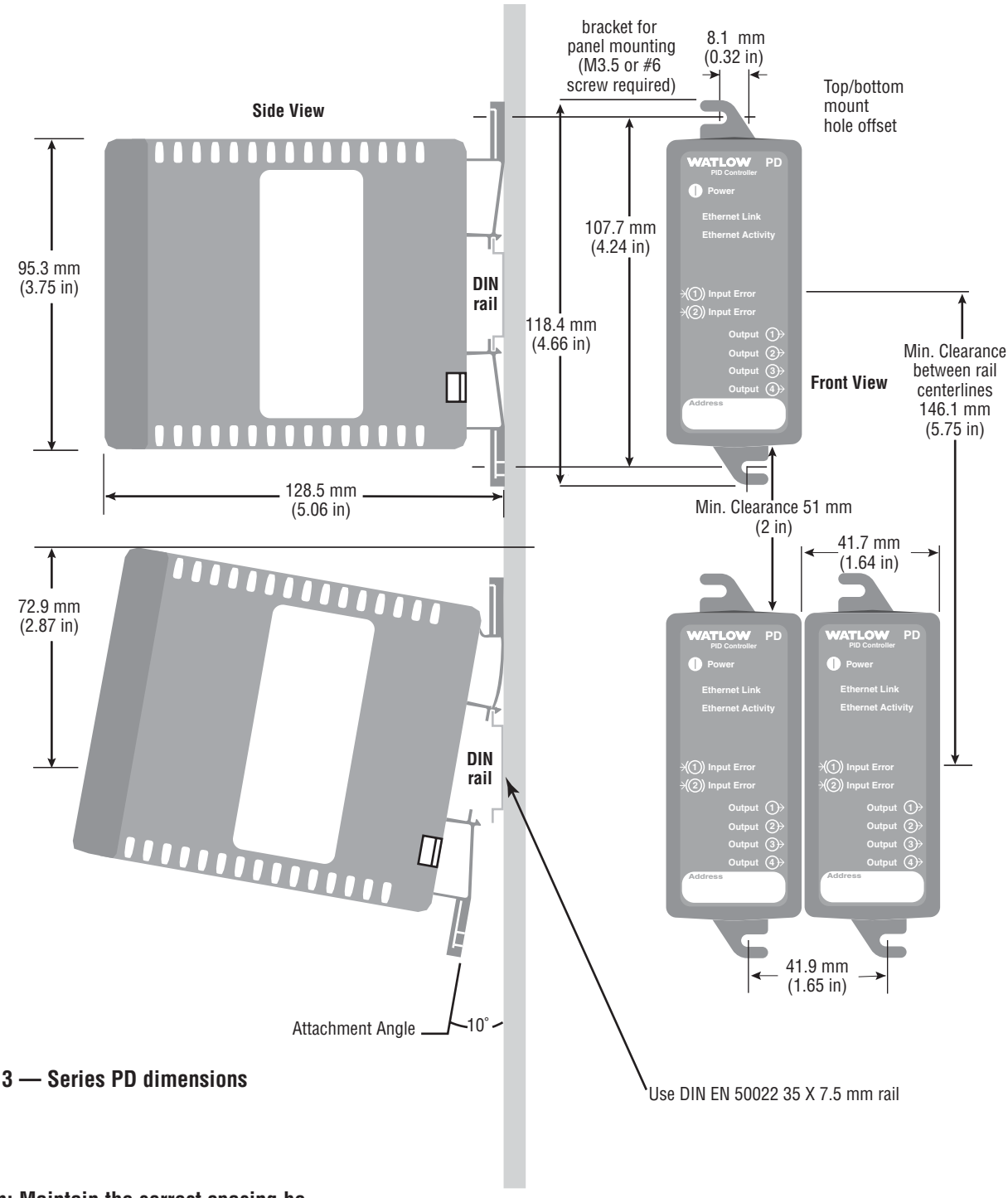


Figure 3 — Series PD dimensions

Caution: Maintain the correct spacing between rows of controllers to allow sufficient air circulation and installation clearance. Failure to do so could result in damage to equipment.

Mounting the Series PD

Figure 4a — Mounting

1. Push unit in and down to catch rail hook on top of rail.
2. Rotate bottom of unit toward rail.
3. Rail clasp will audibly “snap” into place. If the Series PD does not snap into place, check to see if the rail is bent.

Removing the Series PD

Figure 4b — Removal

1. Press down on back of the Series PD until the bottom hook clears the rail.
2. Rotate bottom up and away from rail.

Series PD Connector Locations

Two connectors on the bottom of the unit provide connection points for the input power, inputs and outputs. These connectors are removable and each terminal position is numbered.

The RJ-45 connector is located on the top of the Series PD to allow connection to an Ethernet network.

Input and Output Connectors

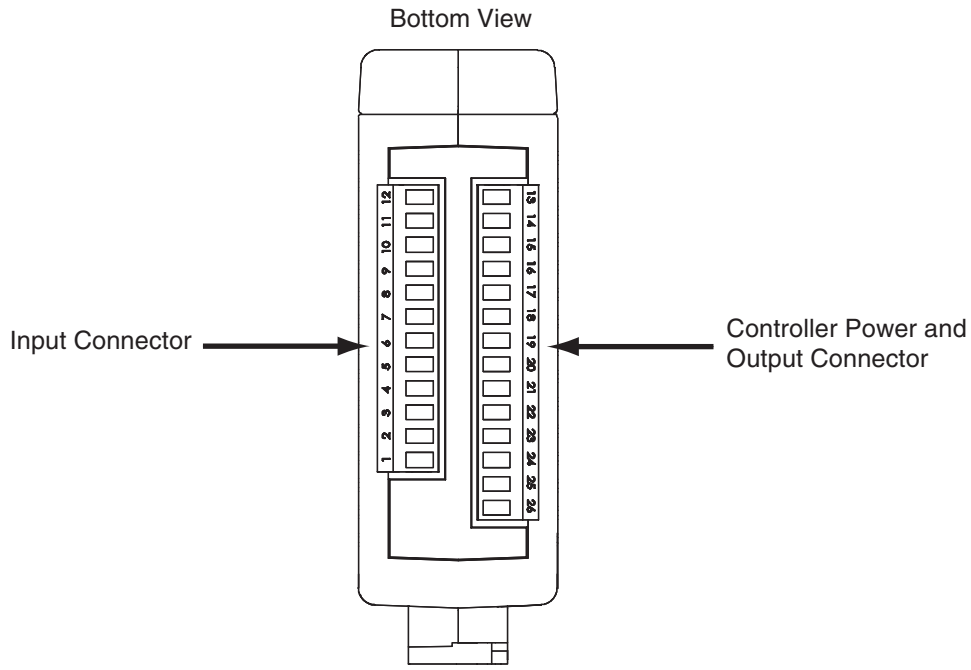


Figure 5a — Input and Output Connectors

Ethernet RJ-45 Connector

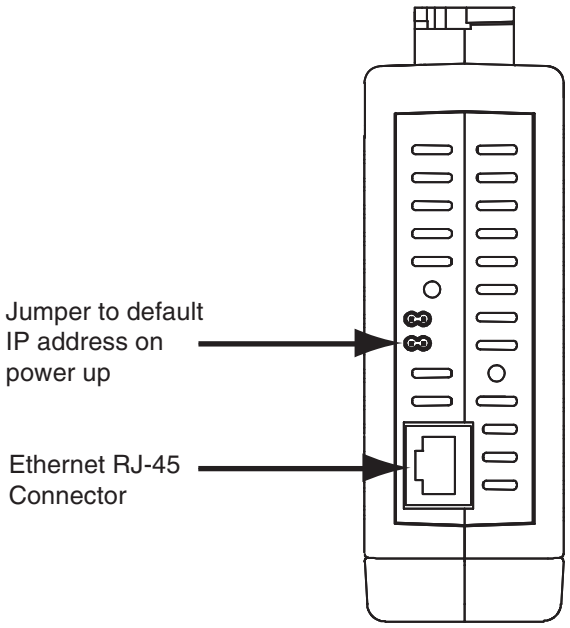


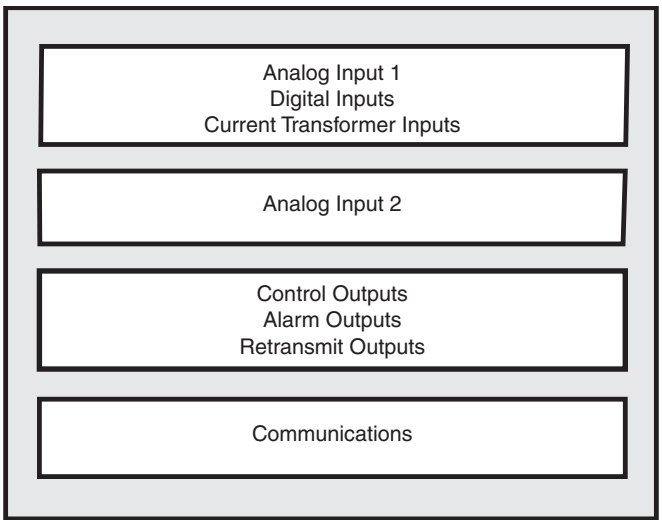
Figure 5b — RJ-45 Connector

Wiring the Series PD

Warning:
Use National Electric (NEC) or other country-specific standard wiring and safety practices when wiring and connecting this controller to a power source and to electrical sensors or peripheral devices. Failure to do so may result in damage to equipment and property, and/or injury or loss of life.

Isolation Blocks

There are no electrical connections between these blocks



Relay outputs (mechanical and solid-state) provide isolation through their relay contacts. Each relay output is isolated from the blocks above and is isolated from other relay outputs.

The model number for each output option appears with its wiring diagram. Check the label on the controller and compare your model number to those shown here and to the model number breakdown in the Appendix of this manual.

All outputs are referenced to a de-energized state.

All wiring and fusing must conform to the National Electric Code and to any locally applicable codes as well.

WARNING: If high voltage is applied to the controller, irreversible damage will occur.

Note: 24 V~ input power required to use single cycle,variable time base output function.

Figure 6a — Power Wiring

(all model numbers)

- Nominal voltage: 24V≈ (ac/dc)

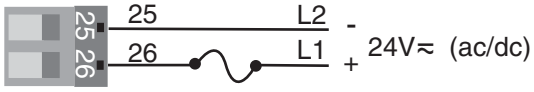


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Figure 7a — Thermocouple Input 1

(all model numbers)

Thermocouples are polarity sensitive. The negative lead (usually red) must be connected to terminal 9.

- Input impedance: >20 MΩ

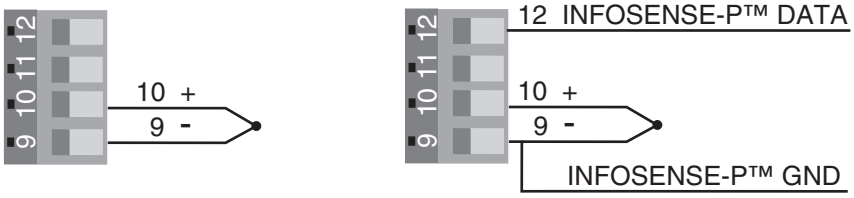


Figure 7b — Thermocouple Input 2

PD**D** _-_ _ _ _-_ _ _ _

Thermocouples are polarity sensitive. The negative lead (usually red) must be connected to terminal 5.

- Input impedance: >20 MΩ
- Input 2 isolated from Input 1

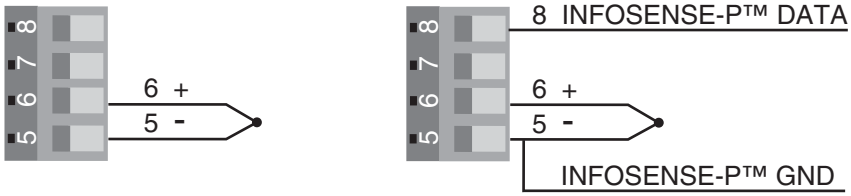


Figure 7c — 2-Wire RTD Input 1 (100 Ω DIN curve 0.00385 Ω/Ω/°C)

(all model numbers)

Terminals 9 and 11 must be shorted for a two-wire RTD.

- Nominal excitation current: 250 µA

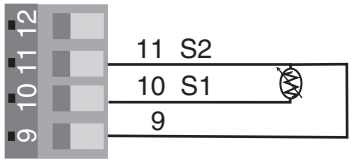
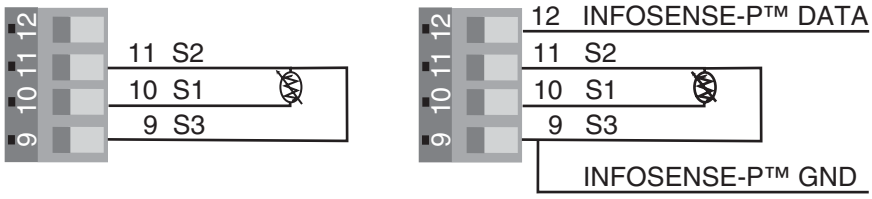


Figure 7d — 3-Wire RTD Input 1 (100 Ω DIN curve 0.00385 Ω/Ω/°C)

(all model numbers)

The S1 lead (usually white) must be connected to terminal 10.

- Nominal excitation current: 250 µA



Warning:
Use National Electric (NEC) or other country-specific standard wiring and safety practices when wiring and connecting this controller to a power source and to electrical sensors or peripheral devices. Failure to do so may result in damage to equipment and property, and/or injury or loss of life.

Figure 8a — 2-Wire RTD Input 2 (100 Ω DIN curve 0.00385 Ω/Ω/°C)

PD**D** _-_ _ _ _-_ _ _ _

Terminals 5 and 7 must be shorted for a two-wire RTD.

- Nominal excitation current: 250 µA

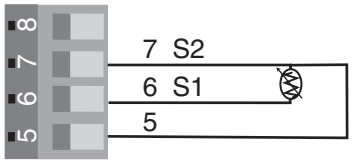
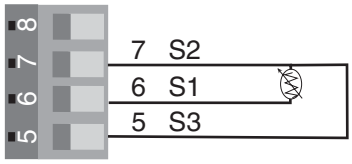


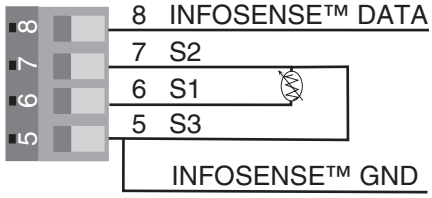
Figure 8b — 3-Wire RTD Input 2 (100 Ω DIN curve 0.00385 Ω/Ω/°C)

PD**D** _-_ _ _ _-_ _ _ _

The S1 lead (usually white) must be connected to terminal 6.

- Nominal excitation current: 250 µA





WARNING: Process input may not have sensor break protection. Outputs can remain full on.

Figure 8c — Input 1, 0 to 10V⎓ (dc) Process Input

(all model numbers)

- Input impedance 20 kΩ, dc only

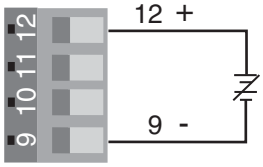
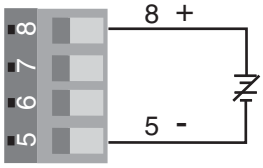


Figure 8d — Input 2, 0 to 10V⎓ (dc) Process Input

PD**D** _-_ _ _ _-_ _ _

- Input impedance 20 kΩ, dc only
- Input 2 isolated from Input 1



Warning:
Use National Electric (NEC) or other country-specific standard wiring and safety practices when wiring and connecting this controller to a power source and to electrical sensors or peripheral devices. Failure to do so may result in damage to equipment and property, and/or injury or loss of life.

WARNING: Process input may not have sensor break protection. Outputs can remain full on.

Figure 9a — Input 1, 0 to 20 mA Process Input

(all model numbers)

- Input impedance 100 Ω, dc only
- Controller does not supply power for the current loop

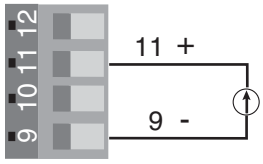
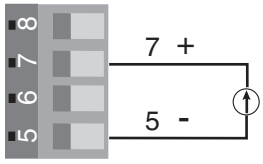


Figure 9b — Input 2, 0 to 20 mA Process Input

PD**D** _-_ _ _ _-_ _ _

- Input impedance 100 Ω, dc only
- Controller does not supply power for the current loop
- Input 2 isolated from Input 1



Dual Digital Inputs

PD_ **1**-_ _ _ _-_ _ _

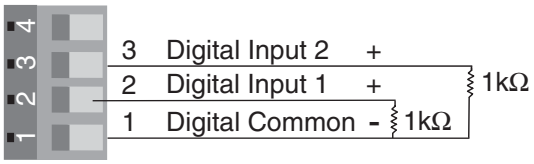
- Input impedance 10kΩ, dc only
- Input 2 isolated from Input 1

Figure 9c — Voltage input

0-1V⎓ (dc) Event Input Low State

2-36V⎓ (dc) Event Input High State

Note: Install a 1kΩ pull-down resistor for each digital input using voltage inputs.



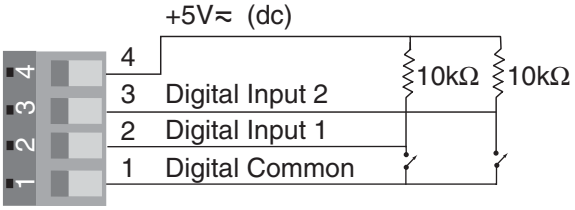
Add a 1kΩ pull down resistor for each active input

Figure 9d — Contact closure

0-2kΩ Event Input Low State

> 7kΩ Event Input High State

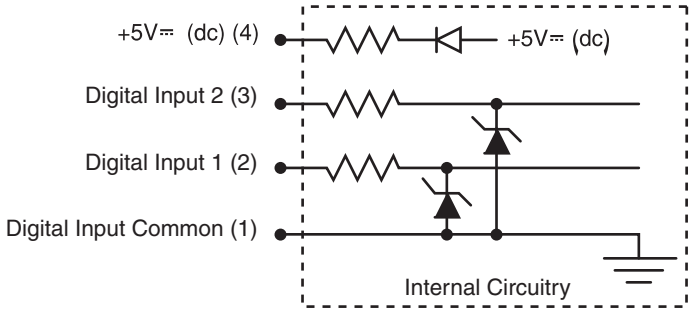
Note: Install a 10kΩ pull-up resistor for each digital input using contact closure inputs.



Add a 10kΩ pull up resistor for each active input

Warning:
Use National Electric (NEC) or other country-specific standard wiring and safety practices when wiring and connecting this controller to a power source and to electrical sensors or peripheral devices. Failure to do so may result in damage to equipment and property, and/or injury or loss of life.

Figure 10a — **Digital input internal circuit**



Dual Current Transformer (CT) Inputs

PD_ **3**-_ _ _ _-_ _ _

• Input impedance 100Ω, Vac only.

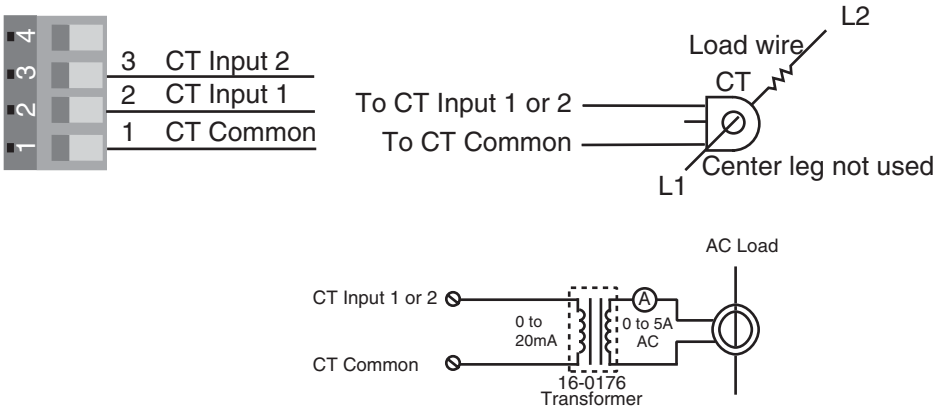
Note: Current transformer (CT) must be purchased separately.

The current transformer (CT) must be purchased separately. Watlow CT part number is 16-0246 (up to 50 amps).

Note: A current transformer input cannot be associated with a process output on Output 1 or 3.

Systems that are more than 50 amps need an interstage transformer. For example, if you use a 300 amp CT, part number 16-0073, and an interstage transformer, part number 16-0176, the 300 amp CT provides a 5 amp signal to the interstage transformer. In turn, the interstage transformer provides a 20 mA maximum signal to the controller.

Figure 10b — **Single Phase**



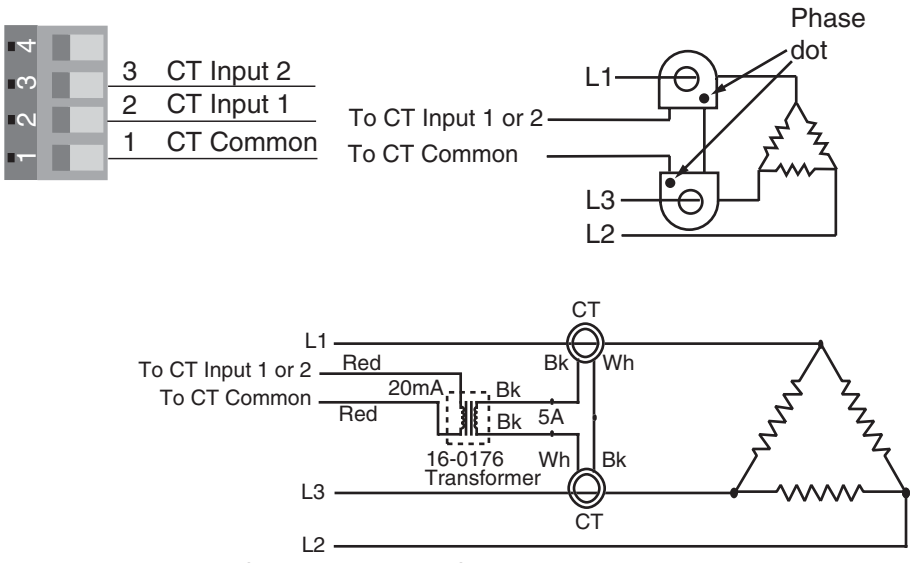
Single phase current sensing up to 300 amp

Warning:
Use National Electric (NEC) or other country-specific standard wiring and safety practices when wiring and connecting this controller to a power source and to electrical sensors or peripheral devices. Failure to do so may result in damage to equipment and property, and/or injury or loss of life.

Note: Current transformer (CT) must be purchased separately.

Note: A current transformer input cannot be associated with a process output on Output 1 or 3.

Figure 11a — **Three Phase using Two Current Transformers**



3-phase current sensing up to 300 amp

One Digital Input and One Current Transformer Input

PD_ **2**-_ _ _ _-_ _ _

Digital Input 1

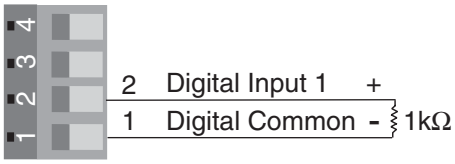
- Input impedance 10kΩ, dc only

Figure 11b — **Voltage input**

0-1V⎓ (dc) Event Input Low State

2-36V⎓ (dc) Event Input High State

Note: Install a 1kΩ pull-down resistor for each digital input using voltage inputs.



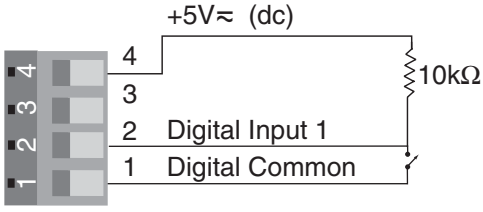
Add a 1kΩ pull down resistor for each active input

Figure 11c — **Contact closure**

0-2kΩ Event Input Low State

> 7kΩ Event Input High State

Note: Install a 10kΩ pull-up resistor for each digital input using contact closure inputs.



Contact Closure (add a 10kΩ pull up resistor for each active input)

Warning:
Use National Electric (NEC) or other country-specific standard wiring and safety practices when wiring and connecting this controller to a power source and to electrical sensors or peripheral devices. Failure to do so may result in damage to equipment and property, and/or injury or loss of life.

Note: Current transformer (CT) must be purchased separately.

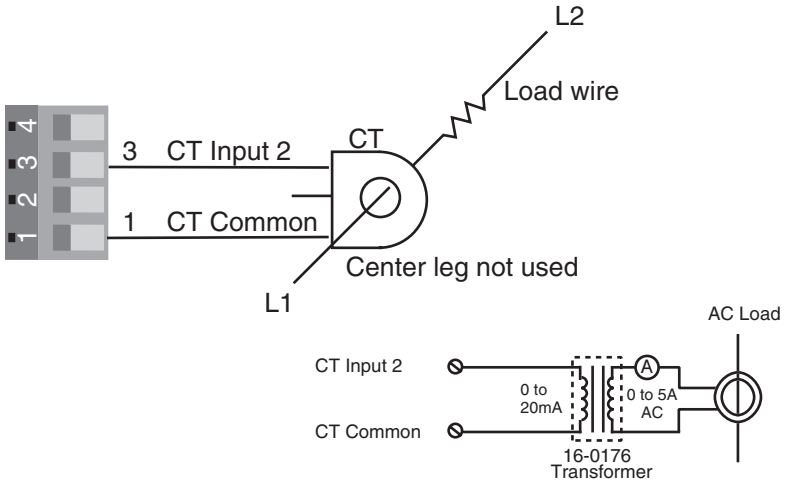
Note: A process output cannot be installed on Output 1 or 3 when using current transformer input.

Figure 12a — Current Transformer Input 2, Single Phase

• Input impedance 100Ω, Vac only

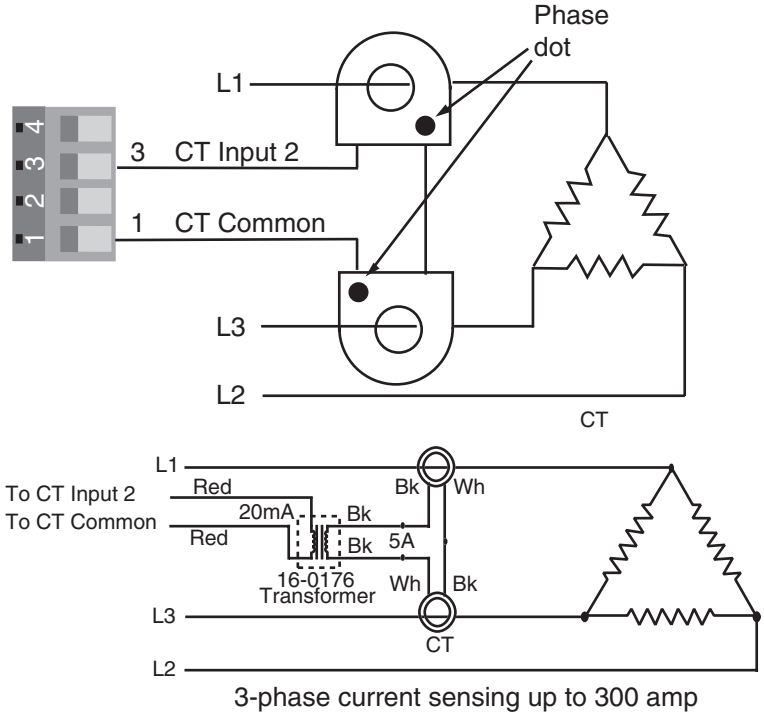
The current transformer must be purchased separately. Watlow current transformer part number is 16-0246 (up to 50 amps).

Systems that are more than 50 amps need an interstage transformer. For example, if you use a 300 amp current transformer, part number 16-0073, and an interstage transformer, part number 16-0176, the 300 amp current transformer provides a 5 amp signal to the interstage transformer. In turn, the interstage transformer provides a 20 mA maximum signal to the controller.



Single phase current sensing up to 300 amp

Figure 12b — Current Transformer Input 2, Three Phase



3-phase current sensing up to 300 amp

Warning:
Use National Electric (NEC) or other country-specific standard wiring and safety practices when wiring and connecting this controller to a power source and to electrical sensors or peripheral devices. Failure to do so may result in damage to equipment and property, and/or injury or loss of life.

Quencharc Note:
Switching pilot duty loads (relay coils, solenoids, etc.) with the mechanical relay or solid-state relay output options requires use of an R.C. suppressor.

Watlow carries the R.C. suppressor Quencharc brand name, which is a trademark of ITW Paktron. Watlow Part No. 0804-0147-0000.

Figure 13a — **Output 1 Mechanical Relay**

PD_ _ - **J** _ _ _ - _ _ _ _

- Form A contact
- 2 A, resistive
- 125 VA pilot duty, 120/240V~ (ac), inductive
- 240V~ (ac) maximum
- 30V⎓ (dc) maximum
- See Quencharc note
- For use with ac or dc
- Minimum load current 10 mA
- Output does not supply power

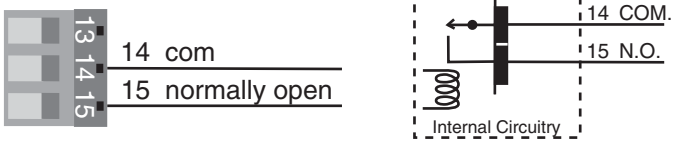
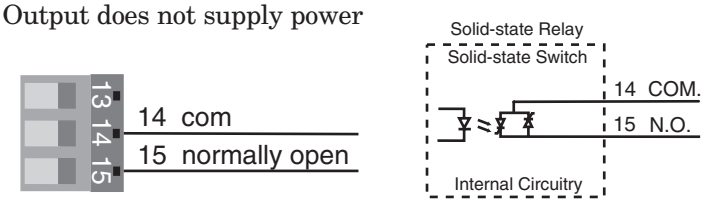


Figure 13b — **Output 1 Solid-state Relay**

PD_ _ - **K** _ _ _ - _ _ _ _

- Form A contact
- 0.5 A, resistive
- 20 VA pilot duty, 120/240V~ (ac), inductive
- 24 to 240V~ (ac)
- See Quencharc note
- Minimum load current 10 mA
- Maximum leakage current 100 µA
- Not for use with direct current (dc)
- Output does not supply power

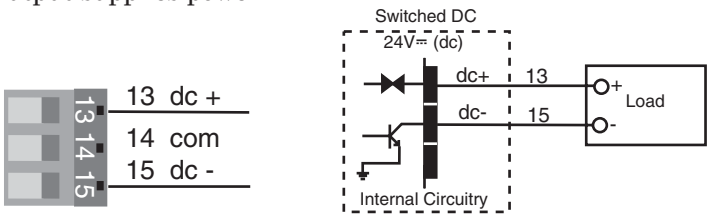


Note: 24 V~ input power required to use single cycle,variable time base output function.

Figure 13c — **Output 1 Switched DC**

PD_ _ - **C**_ _ _ - _ _ _ _

- Supply current 30 mA⎓ (dc) maximum
- Supply voltage 24V⎓ (dc)
- Not recommended for switching mechanical relays
- Output supplies power



Warning:
Use National Electric (NEC) or other country-specific standard wiring and safety practices when wiring and connecting this controller to a power source and to electrical sensors or peripheral devices. Failure to do so may result in damage to equipment and property, and/or injury or loss of life.

Quencharc Note:
Switching pilot duty loads (relay coils, solenoids, etc.) with the mechanical relay or solid-state relay output options requires use of an R.C. suppressor.

Watlow carries the R.C. suppressor Quencharc brand name, which is a trademark of ITW Paktron. Watlow Part No. 0804-0147-0000.

Note: A current transformer input is not available for Output 1 or 3 if a process output.

Note: 24 V~ input power required to use single cycle,variable time base output function.

Figure 14a — Output 1 Open Collector

PD_ _ - **C**_ _ _ - _ _ _ _

- Maximum current sink 200 mA⎓ (dc)
- Maximum supply voltage 42V⎓ (dc)
- Output does not supply power

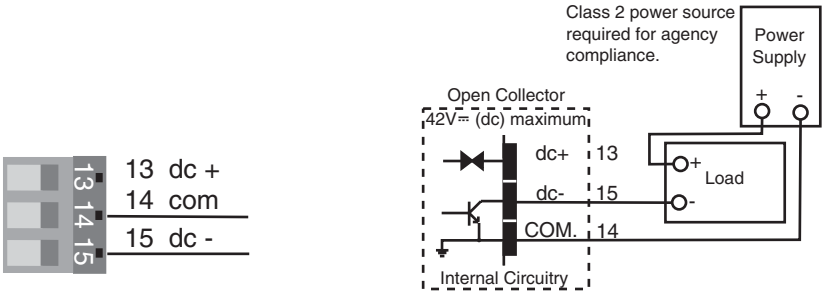


Figure 14b — Output 1 Process

PD_ _ - **F**_ _ _ - _ _ _ _

- Analog output is scalable between 0 to 10V⎓ (dc) or 0 to 20 mA⎓ (dc)
- Load capability: voltage 1 kΩ minimum; current 800 Ω maximum
- Output supplies power
- Cannot use voltage and current output at the same time

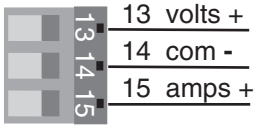
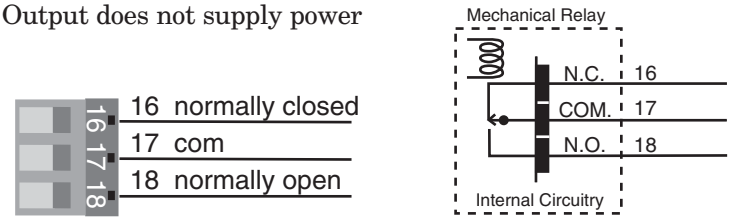


Figure 14c — Output 2 Mechanical Relay

PD_ _ - _ **E** _ _ - _ _ _ _

- Form C contacts
- 2 A, resistive
- 125 VA pilot duty, 120/240V~ (ac), inductive
- 240V~ (ac) maximum
- 30V⎓ (dc) maximum
- See Quencharc note
- For use with ac or dc
- Minimum load current: 10 mA
- Output does not supply power



Warning:
Use National Electric (NEC) or other country-specific standard wiring and safety practices when wiring and connecting this controller to a power source and to electrical sensors or peripheral devices. Failure to do so may result in damage to equipment and property, and/or injury or loss of life.

Quencharc Note:
Switching pilot duty loads (relay coils, solenoids, etc.) with the mechanical relay or solid-state relay output options requires use of an R.C. suppressor.

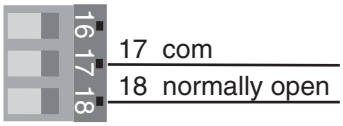
Watlow carries the R.C. suppressor Quencharc brand name, which is a trademark of ITW Paktron. Watlow Part No. 0804-0147-0000.

Note: 24 V~ input power required to use single cycle,variable time base output function.

Figure 15a — **Output 2 Solid-state Relay**

PD_ _ - _ **K** _ _ - _ _ _ _

- Form A contact
- 0.5 A, resistive
- 20 VA pilot duty, 120/240V~ (ac), inductive
- 24 to 240V~ (ac)
- See Quencharc note
- Minimum load current 10mA
- Maximum leakage current 100µA
- Not for use with direct current (dc)
- Output does not supply power



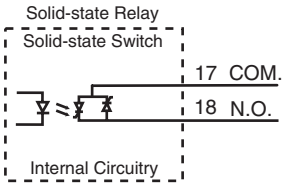
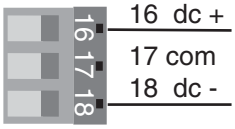


Figure 15b — **Output 2 Switched DC**

PD_ _ - _ **C** _ _ - _ _ _ _

- Maximum supply current 30 mA⎓ (dc)
- Supply voltage 24V⎓ (dc)
- Not recommended for switching mechanical relays
- Output supplies power



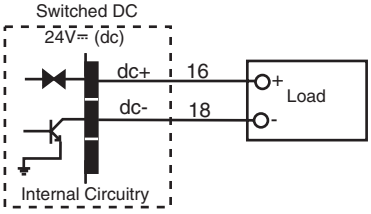
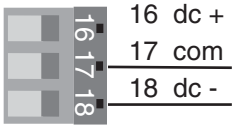
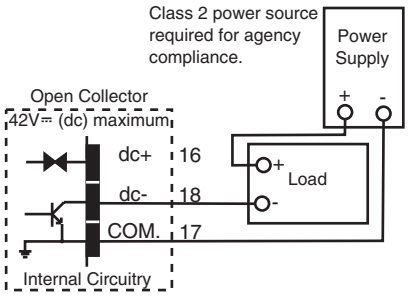


Figure 15c — **Output 2 Open Collector**

PD_ _ - _ **C** _ _ - _ _ _ _

- Maximum current sink 200 mA⎓ (dc)
- Maximum supply voltage 42V⎓ (dc)
- Output does not supply power





Warning:
Use National Electric (NEC) or other country-specific standard wiring and safety practices when wiring and connecting this controller to a power source and to electrical sensors or peripheral devices. Failure to do so may result in damage to equipment and property, and/or injury or loss of life.

Quencharc Note:
Switching pilot duty loads (relay coils, solenoids, etc.) with the mechanical relay or solid-state relay output options requires use of an R.C. suppressor.

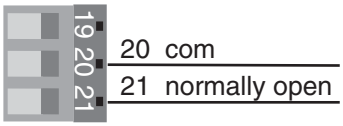
Watlow carries the R.C. suppressor Quencharc brand name, which is a trademark of ITW Paktron. Watlow Part No. 0804-0147-0000.

Note: 24 V~ input power required to use single cycle,variable time base output function.

Figure 16a — Output 3 Mechanical Relay

PD_ _ - _ _ **J** _ - _ _ _ _

- Form A contact
- 2 A, resistive
- 125 VA pilot duty, 120/240V~ (ac), inductive
- 240V~ (ac) maximum
- 30V⎓ (dc) maximum
- See Quencharc note
- For use with ac or dc
- Minimum load current: 10 mA
- Output does not supply power



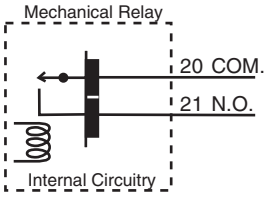
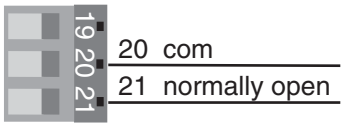


Figure 16b — Output 3 Solid-state Relay

PD_ _ - _ _ **K** _ - _ _ _ _

- Form A.contact
- 0.5 A, resistive
- 20 VA pilot duty, 120/240V~ (ac), inductive
- 24 to 240V~ (ac)
- See Quencharc note
- Minimum load current 10 mA
- Maximum leakage current 100 µA
- Not for use with direct current (dc)
- Output does not supply power



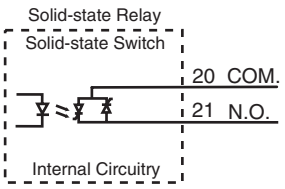
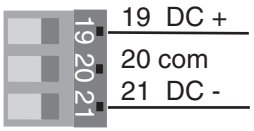
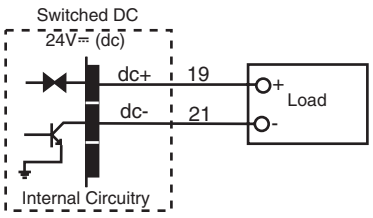


Figure 16c — Output 3 Switched DC

PD_ _ - _ _ **C** _ - _ _ _ _

- Maximum supply current 30 mA⎓ (dc)
- Supply voltage 24V⎓ (dc)
- Not for switching mechanical relays
- Output supplies power





Warning:
Use National Electric (NEC) or other country-specific standard wiring and safety practices when wiring and connecting this controller to a power source and to electrical sensors or peripheral devices. Failure to do so may result in damage to equipment and property, and/or injury or loss of life.

Quencharc Note:
Switching pilot duty loads (relay coils, solenoids, etc.) with the mechanical relay or solid-state relay output options requires use of an R.C. suppressor.

Watlow carries the R.C. suppressor Quencharc brand name, which is a trademark of ITW Paktron. Watlow Part No. 0804-0147-0000.

Note: A current transformer input is not available for Output 1 or 3 if a process output.

Note: 24 V~ input power required to use single cycle,variable time base output function.

Figure 17a — Output 3 Open Collector

PD_ _ - _ _ **C** _ - _ _ _ _

- Maximum current sink 200 mA⎓ (dc)
- Maximum supply voltage 42V⎓ (dc)
- Output does not supply power

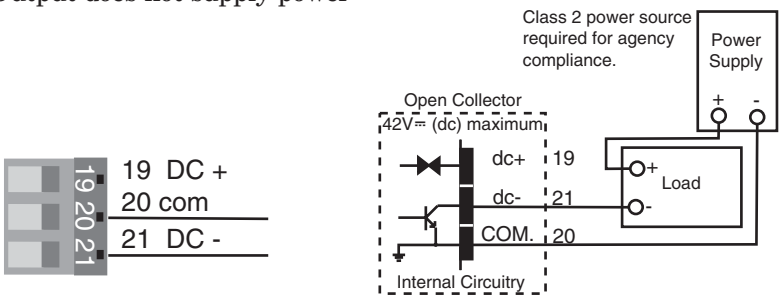


Figure 17b — Output 3 Process

PD_ _ - _ _ **F** _ - _ _ _ _

- Analog output scalable from 0 to 10V⎓ (dc) or 0 to 20 mA⎓ (dc)
- Load capability: voltage, 1 kΩ minimum; current, 800 Ω maximum
- Output supplies power
- Cannot use voltage and current output at the same time

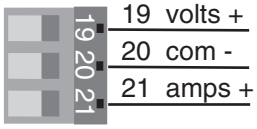
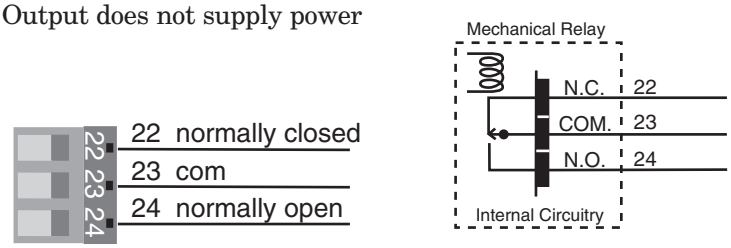


Figure 17c — Output 4 Mechanical Relay

PD_ _ - _ _ _ **E** - _ _ _ _

- Form C.contacts
- 2 A, resistive
- 125 VA pilot duty, 120/240V~ (ac), inductive
- 240V~ (ac) maximum
- 30V⎓ (dc) maximum.
- See Quencharc note
- For use with ac or dc
- Minimum load current: 10 mA
- Output does not supply power



Warning:
Use National Electric (NEC) or other country-specific standard wiring and safety practices when wiring and connecting this controller to a power source and to electrical sensors or peripheral devices. Failure to do so may result in damage to equipment and property, and/or injury or loss of life.

Quencharc Note:
Switching pilot duty loads (relay coils, solenoids, etc.) with the mechanical relay or solid-state relay output options requires use of an R.C. suppressor.

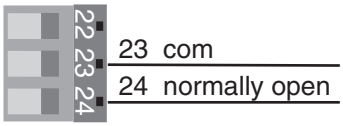
Watlow carries the R.C. suppressor Quencharc brand name, which is a trademark of ITW Paktron. Watlow Part No. 0804-0147-0000.

Note: 24 V~ input power required to use single cycle,variable time base output function.

Figure 18a — Output 4 Solid-state Relay

PD_ _ - _ _ _ **K** - _ _ _ _

- Form A.contact
- 0.5 A, resistive
- 20 VA pilot duty, 120/240V~ (ac), inductive
- 24 to 240V~ (ac)
- See Quencharc note
- Minimum load current 10mA
- Maximum leakage current 100µA
- Not for use with direct current (dc)
- Output does not supply power



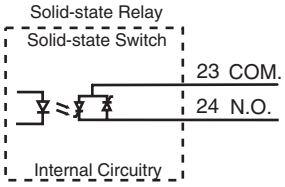
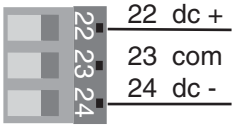


Figure 18b — Output 4 Switched DC

PD_ _ - _ _ _ **C** - _ _ _ _

- Maximum supply current 30 mA⎓ (dc)
- Supply voltage 24V⎓ (dc)
- Not recommended for switching mechanical relays
- Output supplies power



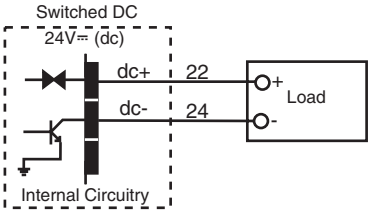
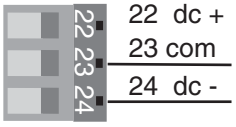
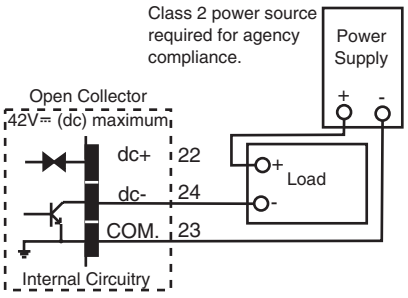


Figure 18c — Output 4 Open Collector

PD_ _ - _ _ _ **C** - _ _ _ _

- Maximum current sink 200 mA⎓ (dc)
- Maximum supply voltage 42V⎓ (dc)
- Output does not supply power





3 Indicator Lights

The Series PD controller may have up to nine LED indicator lights to help you monitor the status of input power, Ethernet functions, input errors and outputs status. These LEDs can provide a quick visual indication of basic controller functions. An additional heartbeat LED, used for diagnostics, can be seen through the top vent at the back left side of the controller.

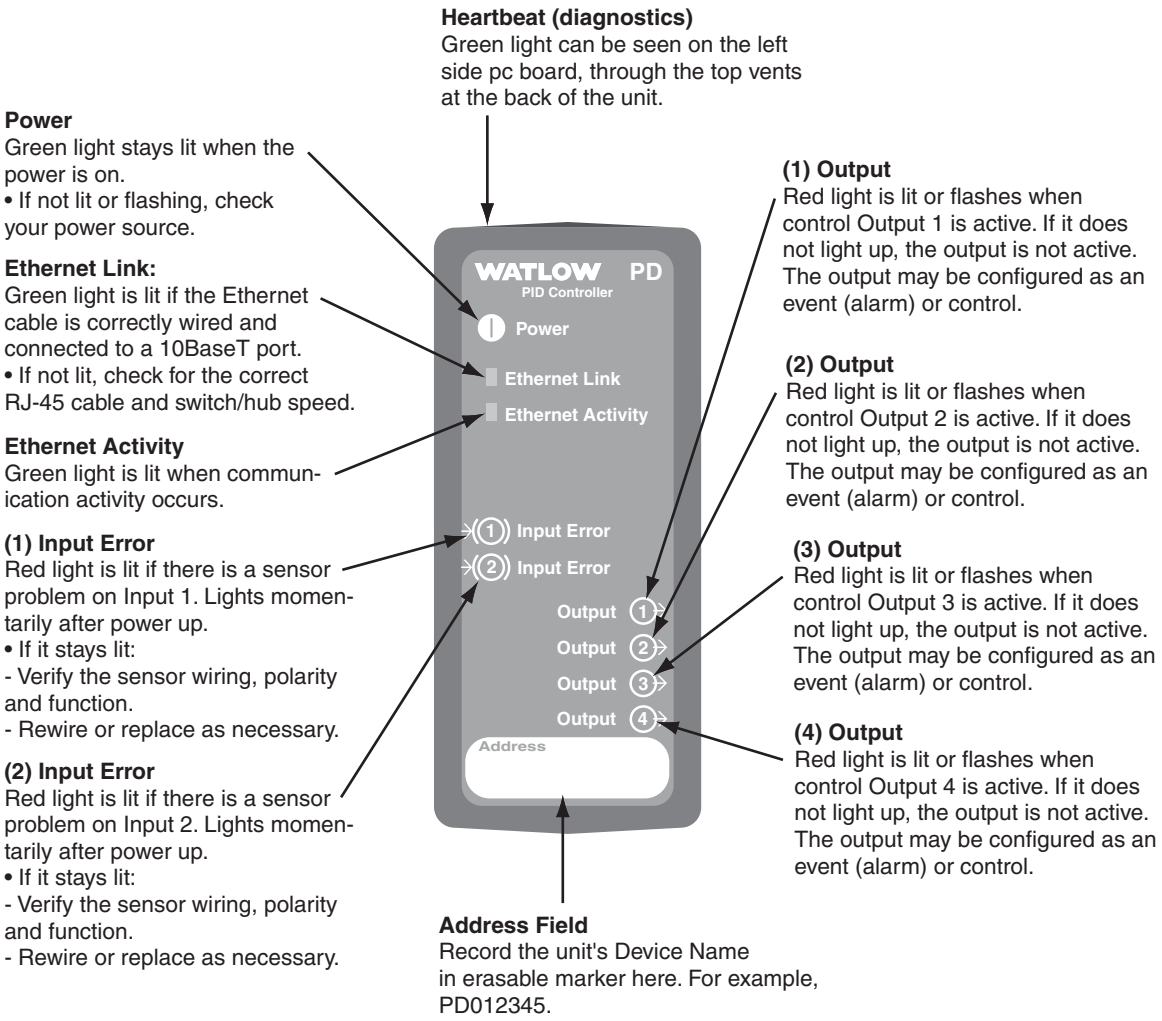

Heartbeat (diagnostics)
Green light can be seen on the left side pc board, through the top vents at the back of the unit.
Power
Green light stays lit when the power is on.
• If not lit or flashing, check your power source.
Ethernet Link:
Green light is lit if the Ethernet cable is correctly wired and connected to a 10BaseT port.
• If not lit, check for the correct RJ-45 cable and switch/hub speed.
Ethernet Activity
Green light is lit when communication activity occurs.
(1) Input Error
Red light is lit if there is a sensor problem on Input 1. Lights momentarily after power up.
• If it stays lit:
- Verify the sensor wiring, polarity and function.
- Rewire or replace as necessary.
(2) Input Error
Red light is lit if there is a sensor problem on Input 2. Lights momentarily after power up.
• If it stays lit:
- Verify the sensor wiring, polarity and function.
- Rewire or replace as necessary.
WATLOW PD
PID Controller
Power
Ethernet Link
Ethernet Activity
1 Input Error
2 Input Error
Output 1
Output 2
Output 3
Output 4
Address
(1) Output
Red light is lit or flashes when control Output 1 is active. If it does not light up, the output is not active. The output may be configured as an event (alarm) or control.
(2) Output
Red light is lit or flashes when control Output 2 is active. If it does not light up, the output is not active. The output may be configured as an event (alarm) or control.
(3) Output
Red light is lit or flashes when control Output 3 is active. If it does not light up, the output is not active. The output may be configured as an event (alarm) or control.
(4) Output
Red light is lit or flashes when control Output 4 is active. If it does not light up, the output is not active. The output may be configured as an event (alarm) or control.
Address Field
Record the unit's Device Name in erasable marker here. For example, PD012345.

Figure 18 — Series PD LED Indicator Lights

Heartbeat LED Diagnostics:

- Application Mode (normal operation) - 1 flash per second
- Test Mode (internal factory calibration) - 10 flashes per second
- Boot Code (internal factory configuration) - 1 flash per 2 seconds

Both Input Error LEDs Lit

- TFTP Mode (flash download in progress)

4 Ethernet Communications

Network security is a critical issue for any network. Be sure to work with your network administrator to ensure that you follow best security practices to ensure a secure network environment. Here are some items to consider when installing Ethernet based controls on any network.

- Use private IP addresses.
- Separate the process network(s) from business network(s).
- If external access is required, then have a single point of access to the process network.
- External access points should be protected by a firewall.
- External access points should be protected by a layer 3 switch or router.
- Access to the Internet should be indirect, going through an access point to the business network on the way.
- Separate processes or cells using VLANs.
- Run virus protection software on all PC's on the process network.

Refer to the bottom of the web page navigation frame for the browser versions supported. You may access the Series PD and view controller parameters via an onboard Web (HTTP) server.

The Series PD supports full product configuration and monitoring of runtime parameters via MODBUS TCP over TCP/IP using a third party software package such as Lookout™, created and sold by National Instruments.

The 10BaseT Ethernet connection supports the TCP/IP stack. At the application layer it has an HTTP (web) and Modbus server. The HTTP server provides a means of changing runtime parameters via HTML. The TCP/IP stack supports DHCP client, Auto IP, Static IP, DNS client, and Netbios name resolution.

Getting Started

1. Connect the Series PD to your computer's Ethernet port using a cross-wired RJ45 cable or connect the Series PD to a switch/hub or network using a straight wired RJ45 Category 5 cable. The Series PD is limited to a 10BaseT connection and will not work on an Ethernet port set for 100BaseT only. Use of a 10/100 switch/hub will overcome this issue if your PC has only a 100BaseT port.
2. Wire a 24V≂ (ac/dc) power supply to the Series PD power terminals. See wiring section.
3. Wire sensor inputs and controller outputs. See wiring section.
4. Power up the controller, switch/hub and PC.
5. Start your Internet browser. Enter the Browse at address of the Series PD into the browser's address field. See figure on next page for the Browse at address location on the left side label. Two different Netbios names may be used to access the Series PD. Either PDxxxxxx, where xxxxxx is the first six digits of the serial number, located on the left side label, or WATxxxxxx, where xxxxxx is the last six digits of the Series PD MAC address. The MAC address is also printed on the left side label of the Series PD in the form xx:xx:xx:xx. See figure on next page.

Note: Browsing the Series PD using the Netbios name only works with Windows. The computer and Series PD must be on the same logical network. Browsing using the IP address always works.

Note: If you are not using a DHCP server, it may take several minutes for both the Series PD and your computer to get their IP addresses.

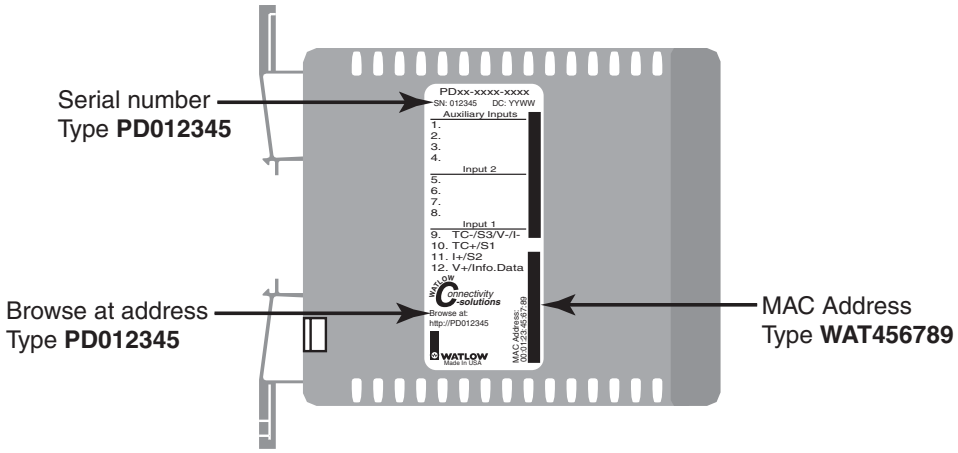


Figure 21 — Browse at address, MAC address, and Serial number locations

6. When you change data on the Monitor Device page or access other web pages, you are prompted to enter a Network Security user name and password. The factory defaults are:

   user name - **new**

   password - **user**

7. Once you enter the user name and password you can access the other controller pages. If you browse another address or close your browser, you will be required to enter this information again.
8. To change security level passwords, go to **Device Configuration > Network > Security**.
9. To configure the Series PD, go to **Device Configuration** and set up the unit.

Note: The controller leaves the factory with all inputs, outputs and control loops set to off.

Go through each Device Configuration page and make the appropriate selections for your application. Click the Submit button at the bottom of each page.

Note: Be sure to click the Submit button at the bottom of any Device Configuration screen to send your changes to the controller. Changes are not entered into the controller until you submit them.

9. Select the Monitor Device page. The process values and set points are displayed. You can change controller set point and the mode of operation, auto or manual. Select the parameter value you want to change by clicking on it, enter the new parameter value and click the Submit button. This sends the Series PD the new value and refreshes the Monitor Device page.

Note: Information on the Monitor Device page, including alarms and errors, is automatically refreshed once per second, if your browser supports Java Virtual Machine and is enabled to allow Java applets to run.

Network Services

The Series PD supports DHCP client, Auto IP, and Static IP for address assignment. Normally you will not need to make any changes. The user is able to configure preferences as to which services are used if available. Intelligence is employed within the Series PD to revert to backup IP assignment methods if the primary method is unavailable. It will try DHCP first, then Auto IP to assign an IP address. This is the same method that a Windows based computer uses to get an IP address.

When using Auto IP, the Series PD starts with the IP address 169.254.10.10. If this address is already in use, it will randomly attempt other addresses in the 169.254.XX.XX subnet. As with any IP networking device, the IP address assigned to the Series PD must be compatible with the network it is physically connected to.

Note: If you are using Auto IP, it may take several minutes for both the Series PD and your computer to get their IP addresses.

The Series PD does support DNS client and Netbios name resolution. Configuration information may be entered at the Network Display Setup page.

Note: If you forget the fixed IP address of your Series PD, short the jumper connections on the top of the unit (see page 5), turn the input power off and back on again. This causes the Series PD to use DHCP first, AutoIP and finally fixed IP addressing to try assigning an IP address. This allows you to read the current fixed IP address. Once the unit is powered up without the jumper connections shorted, the Series PD returns to using the previous IP addressing settings.

5 Monitor Device Page

When accessing a Series PD controller through a browser, the Monitor Device page appears. The Monitor Device page contains real-time information representing the current process conditions. This information is loaded when the Monitor Device page is browsed and is automatically refreshed once every second. The Monitor Device page provides real-time information on:

- Input Status
- Control Loop Status
- Alarm Status.

Input errors and alarms appear on this page as a red box next to the related input or output. These are refreshed once a second.

If you try to change any values on the Monitor Device page, you are prompted to enter Network Password information. The User Name is ***new*** and Password is ***user***. Be sure to change your user name and password if controller security is a concern. If you want your browser to remember the User Name and Password after you enter it the first time, check the box, Save this password in your password list. If you close your browser, you must re-enter your user name and password information.

Note: You must have Java Virtual Machine installed on your computer and Java must be enabled for the Monitor Device page to display properly in your browser. Most browsers will already have this configured by default.

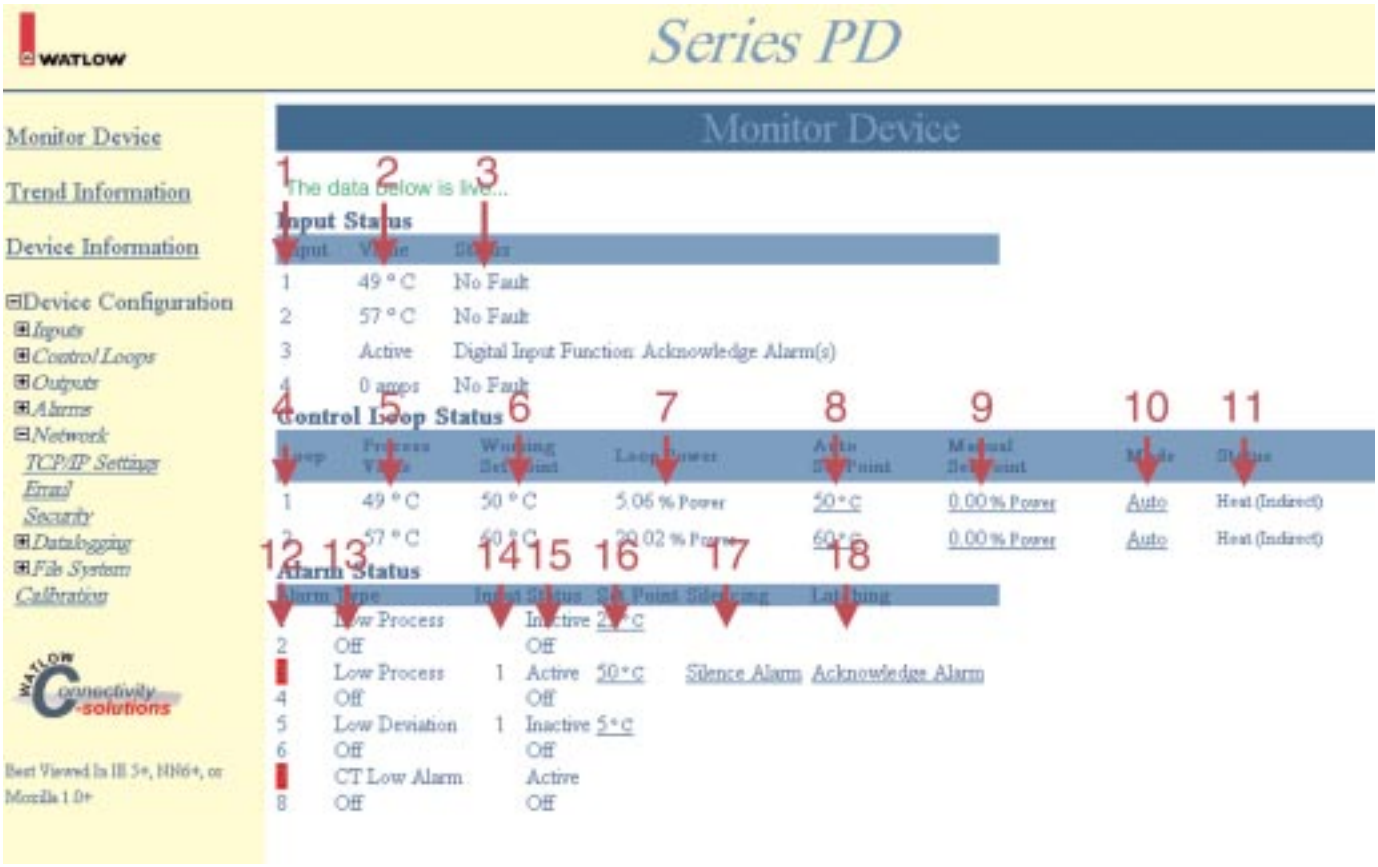


Figure 22 — Monitor Device Web Page Example

Note: Red tag arrows and tag numbers are links to item descriptions. Click on a red tag arrow or number to go to a description of the item.

Navigation Frame

The left side of the Series PD web pages contain a navigation frame that looks and operates much like Windows Explorer™. This frame does not change as web pages are accessed and changed. The navigation area contains folders and web page links. A plus (+) sign in front of a folder indicates the folder can be expanded to show more information. A minus (-) sign in front of a folder indicates the folder can be contracted to show less information.

For example, if you click on the + sign in front of the Device Configuration folder or click on the Device Configuration folder itself, you expand the Device Configuration folder. The folders that appear contain additional folders as indicated by the + sign in front of each folder. Click on the + or - sign in front of any folder or click on the folder itself to expand or contract that folder.

When you see page links (underlined text), you can click on a link to take you to a specific Series PD web page. For example, with the Inputs folder expanded, click on the Analog Input 1 link to go to the Analog Input 1 Configuration page.

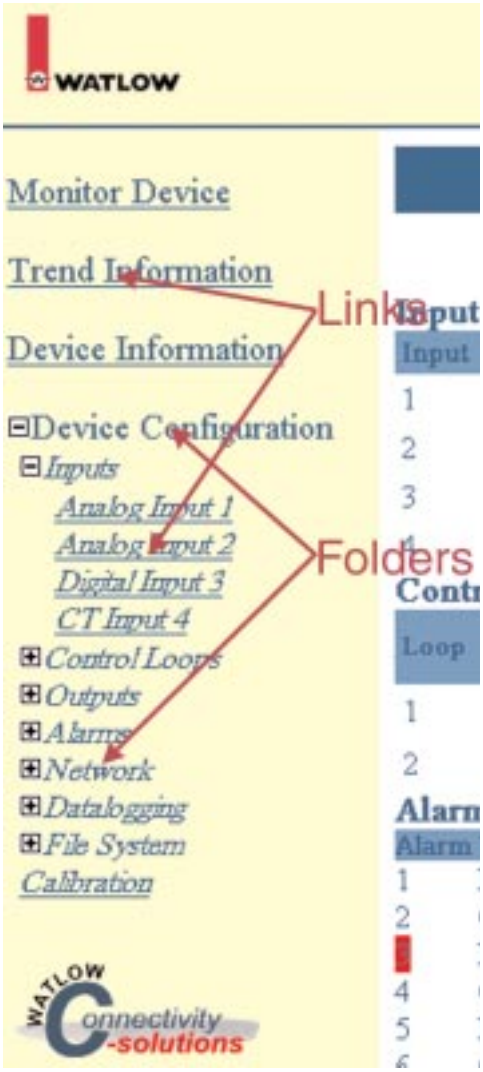


Figure 23 — Navigation Frame Example

Tag #	Monitor Device Page Parameters	Parameter Description
	Input Status	
1.	**Input Number**	Identifies input hardware that is installed. Red box appears for any input that is in a fault condition.
2.	**Input Value**	Actual analog input value for Inputs 1 and 2. Digital Input condition or Current Transformer input value for Inputs 3 and 4.
3.	**Input Status**	Input error status for analog, digital or current transformer inputs.
	Control Loop Status	
4.	**Control Loop Number**	Identifies control loop hardware that is installed. Loop 2 appears only on dual loop models.
5.	**Control Loop Process Value**	Actual analog input value for the control loop(s). Active analog inputs can be assigned to either control loop.
6.	**Control Loop Working Set Point**	Active set point. Could be one of several set point sources, Auto Set Point, Digital Set Point, or Ramp to Set Point
7.	**Control Loop Power**	Actual ouput power level for each control loop.
8.	**Control Loop Auto Set Point**	Automatic mode (closed loop) set point. Click on the desired loop set point, enter the new Auto Set Point value in the pop up window and click Submit. The page refreshes and displays the new Monitor Device page data.
9.	**Control Loop Manual Set Point**	Manual mode (open loop, % power) set point. Click on the desired loop manual set point, enter the new Manual Set Point value in the pop up window and click Submit. The page refreshes and displays the new Monitor Device page data.
10.	**Control Loop Mode**	Loop control mode. Automatic mode (closed loop control), Manual mode (open loop control) or Off (loop disabled).
11.	**Control Loop Status**	Control loop output function. Heat, Cool, Heat/Cool or Off (disabled) output operation.
	Alarm Status	
12.	**Alarm Number**	Identifies alarms. Red box appears for any alarm that is active.
13.	**Alarm Type**	Deviation Alarm, Process Alarm or Off (disabled).
14.	**Alarm Input**	Analog input assigned to the alarm.
15.	**Alarm Status**	Indicates if an alarm is inactive, active or off (disabled). Red box appears in Alarm Number column when alarm is active
16.	**Alarm Set Point**	Trip point for the alarm. Click on the desired alarm set point, enter the new Alarm Set Point value in the pop up window and click Submit. The page refreshes and displays the new Monitor Device page data.
17.	**Alarm Silencing**	If enabled, the alarm output can be disabled. A Silence Alarm link appears on the Monitor Device page when the alarm trips. Click this link to disable the alarm output.
18.	**Alarm Latching**	If enabled, the alarm output latches when tripped. An Acknowledge link appears on the Monitor Device page when the alarm trips. Once the process returns to the safe region, click this button to reset the latched alarm output.

Figure 24 — Monitor Device Web Page Tag Descriptions

6 Device Information Page

The Device Information page provides important information about the Series PD controller. Information on the controller hardware, its configuration and network settings can be easily accessed from this page. The time and date the page was loaded appears at the top of the page. This page is not automatically refreshed. The Device Information page provides information on:

- Inputs
- INFOSENSE™ Data
- Outputs
- Control Loops
- Device Identification
- Current Network Settings

Note: If you are going to Restore Factory Defaults or Restore User Settings, we strongly recommend that you document all of your settings first. Be sure to document your Current Network Setttings, found at the bottom of the Device Information page.

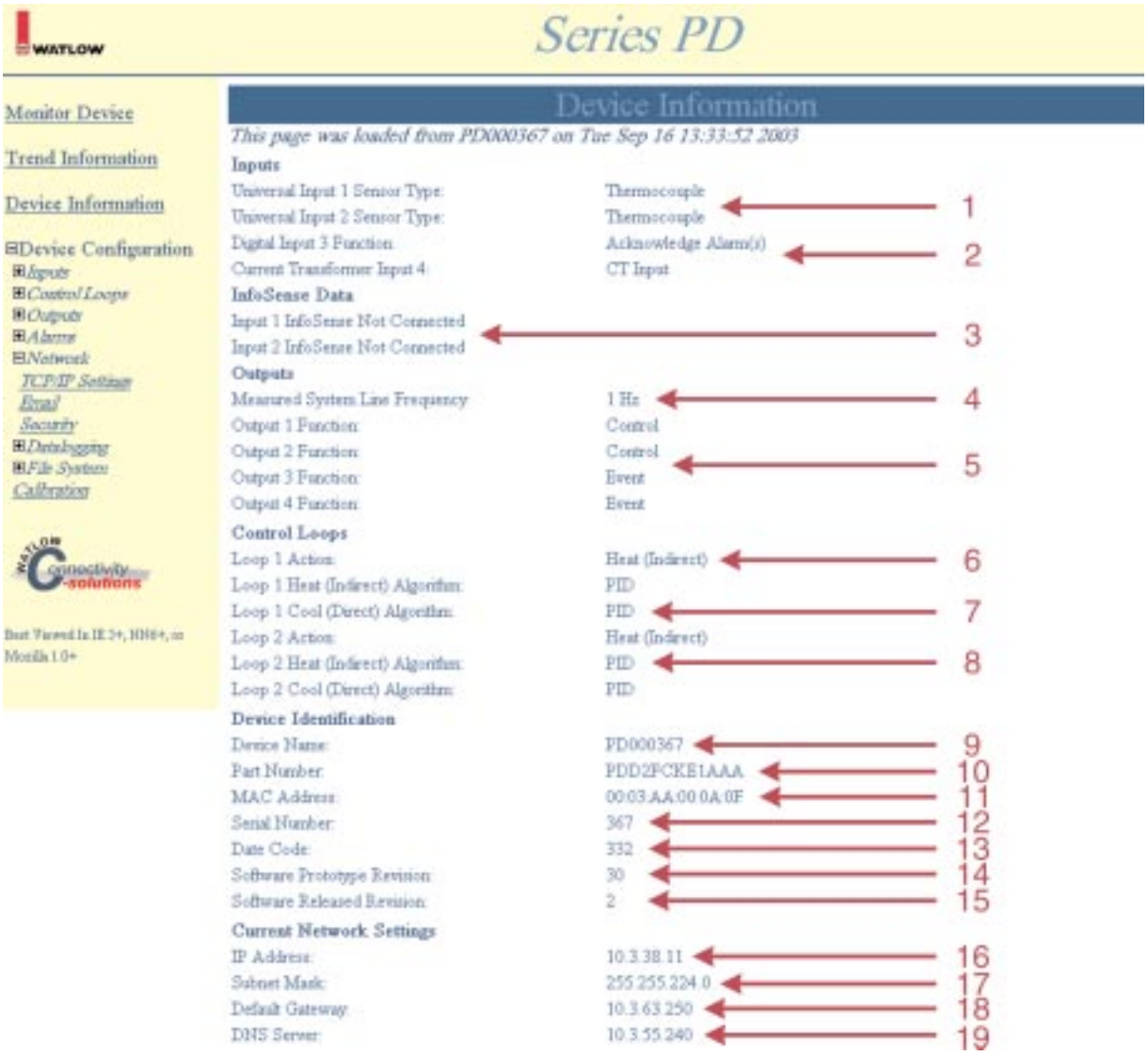


Figure 25 — Device Information Web Page Example

Note: Red tag arrows and tag numbers are links to item descriptions. Click on a red tag arrow or number to go to a description of the item.

Tag #	Device Information Configuration Parameters	Section Description
	Inputs	
1.	**Universal Input Sensor Type**	Displays what input hardware is present and input configuration information. Inputs 1 and 2 are universal analog inputs and will accept a wide variety of input signals. Input 2 is an ordering option. See model number information
2.	**Digital Input Function** **Current Transformer Input**	Inputs 3 and 4 can be ordered as digital or current transformer inputs. See model number information. Digital Input Function - displays what action is taken when the digital input condition is satisfied. Current Transformer Input - displays what CT hardware is present and enabled.
	INFOSENSE	
3.	**INFOSENSE Data**	Displays specific sensor data when connected to an INFOSENSE sensor. The part number, serial number and calibration date information is retrieved from the INFOSENSE sensor.
4.	**Measured System Line Frequency**	Displays system power line frequency. If correct frequency is not detected, single cycle burst firing mode not available. See Features chapter.
	Outputs	
5.	**Output 1-4**	Displays what output hardware is present and output configuration information.
	Control Loops	
6.	**Loop Action**	Displays control loop action; heat, cool, heat/cool or off (disabled).
7.	**Loop Cool Algorithm**	Displays control loop cool algorithm selected, On/Off or PID.
8.	**Loop Heat Algorithm**	Displays control loop heat algorithm selected, On/Off or PID.
	Device Identification	
9.	**Device Name**	Displays the assigned Netbios name. The default device name is PDXXXXXX, where XXXXXX is the serial number. This name can be changed on the TCP/IP Settings page in the Network folder. Not all computer networking configurations support Netbios names.
10.	**Part Number**	Displays the Series PD model number.
11.	**MAC Address**	Displays the assigned MAC address. You can also use the MAC address as another Netbios name to browse the Series PD by using WATXXXXXX, where XXXXXX are the last six digits of the MAC address without colons. Not all computer networking configurations support Netbios names.

Figure 26 — Device Information Web Page Tag Descriptions

Tag #	Device Information Configuration Parameters	Section Description
12.	**Serial Number**	Displays the Series PD serial number.
13.	**Date Code**	Displays the date the unit was manufactured. The format is year week. For example, 345 would be 2003, 45th week.
14.	**Software Prototype Revision**	Displays firmware prototype revision.
15.	**Software Released Revision**	Displays firmware release revision.
	Current Network Settings	
16.	**IP Address**	Displays IP address number. Series PD supports DHCP client, autoIP and fixed IP address assignment.
17.	**Subnet Mask**	Displays current subnet mask.
18.	**Default Gateway**	Displays current default gateway.
19.	**DNS Server**	Displays current DNS server.

Figure 27 — Device Information Web Page Tag Descriptions (continued)

7 Device Configuration Page

The Device Configuration page contains folders and links for configuring the Series PD. The controller leaves the factory with default settings that disable most input and output functions. To get the Series PD operational, you must go through the Device Configuration folders and set up the controller. The Device Configuration folders are:

- Inputs
- Control Loops
- Outputs
- Alarms
- Network
- Datalogging
- File System

Note: You may not see all of the Device Configuration page folders listed above. Your model number determines what folders appear.

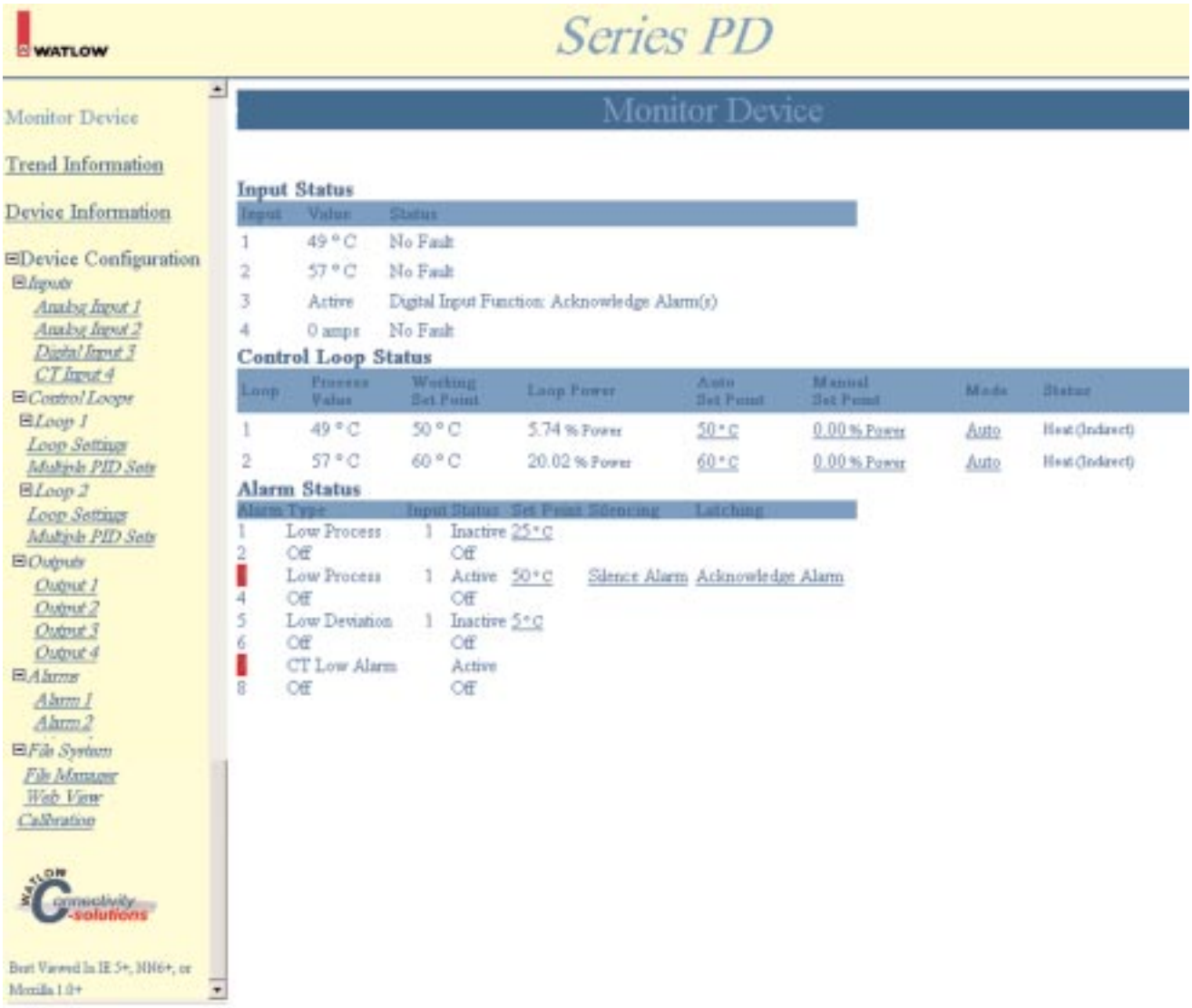


Figure 28 — Device Configuration Navigation Frame Expanded Example

Inputs

The Inputs folder contains links for configuring the inputs installed in the Series PD. The controller leaves the factory with default settings that disable all input functions. To get the Series PD operational, you must go through the Inputs links and set up the controller inputs. The Inputs folder links are:

- Analog Input 1
- Analog Input 2 (dual channel model only)
- Digital Input 3 or 4
- Current Transformer Input 3 or 4

Note: You may not see all of the Inputs folder links listed above. Your model number determines what input parameters appear.

Analog Input Configuration Page

Inputs 1 and 2 are analog inputs. Analog inputs are used to measure process variables like temperature, humidity, pressure, flow, level, etc. The universal analog inputs accept most common thermocouple types, 100Ω Platinum RTD (DIN curve) and process input signals. Input 2 only appears on dual channel models.

You can see and change all of the parameters on the Analog Input Configuration page. Only those that apply to the sensor type selected will be relevant. For example, you can set all of the process parameters even though you have thermocouple enabled. Only parameters relating to thermocouples have any effect on the controller. If you change the sensor type to process, those process parameter values previously entered are used.

Note: You must click Submit to send the new values to the Series PD.

Figure 29 — Analog Input Configuration Web Page Example

Note: Red tag arrows and tag numbers are links to item descriptions. Click on a red tag arrow or number to go to a description of the item.

Tag #	Analog Input Configuration Parameters	Parameter Description
Analog Input		
1.	**Sensor Type**	Selects the analog input sensor type. Off (disabled), thermocouple, RTD, voltage process, current process or INFOSENSE PnP
Thermocouple Parameters		
2.	**Thermocouple Type**	Selects the analog input thermocouple linearization. Type J, K, B, T, E, N, C, D, PTII, R or S.
RTD Parameters		
3.	**RTD Curve**	Sets the RTD calibration curve. DIN curve only.
Process Parameters		
4.	**Process Precision**	Sets the decimal position for the process input. 0, 0.0, 0.00 or 0.000.
5.	**Process Units**	Selects the units label displayed on the web page. Up to four alpha- numeric characters.
6.	**Low Process Scale**	Sets the low scale value for the process input signal. For example, if you want 4-20 mA to represent 0 to 100%RH, set low process scale to 0.
7.	**High Process Scale**	Sets the high scale value for the process input signal. For example, if you want 4-20 mA to represent 0 to 100%RH, set high process scale to 100.
8.	**Low Voltage Scale**	Sets the low range value for the voltage input signal. For example, if you need 1-5 Vdc, set low voltage scale to 1.
9.	**High Voltage Scale**	Sets the high range value for the voltage input signal. For example, if you need 1-5 Vdc, set high voltage scale to 5.
10.	**Low Current Scale**	Sets the low range value for the current input signal. For example, if you need 4-20 mA, set low current scale to 4.
11.	**High Current Scale**	Sets the high range value for the current input signal. For example, if you need 4-20 mA, set high current scale to 20.
Temperature Process Value Configuration		
12.	**Temperature Process Value Units**	Sets the temperature measurement units. Celcius or Fahrenheit.
13.	**Temperature Process Value Precision**	Selects the decimal location for temperature inputs. 0 or 0.0.
Input Filtering		
14.	**Filter Method**	Selects the filtering action for the input signal. Off (disabled) or First Order.
15.	**Filter Time Base**	Sets the time constant for the first order filter. 0.1 to 60.0 seconds.
Offsets		
16.	**Single Offset Value**	Shifts the input signal up or down.

Figure 30 — Analog Input Web Page Tag Descriptions

Digital Input Configuration Page

Inputs 3 and 4 can be ordered as digital inputs. The digital input accepts a contact closure or a dc voltage input, and performs some function based upon the digital event input status. For example, when the digital event input is low, switch to a different auto set point value. If the digital event input goes back high, switch back to the original control auto set point value. See Features chapter.

You can see and change all of the parameters on the Digital Input Configuration page. Only those that apply to the function selected will be relevant. For example, you can set all of the Acknowledge Alarm parameters even though you have Switch to Digital Set Point enabled. Only parameters relating to Switch to Digital Set Point have any effect on the controller. If you change the function to Acknowledge Alarms, those alarm related parameters previously entered are used.

Note: You must click Submit to send the new values to the Series PD.

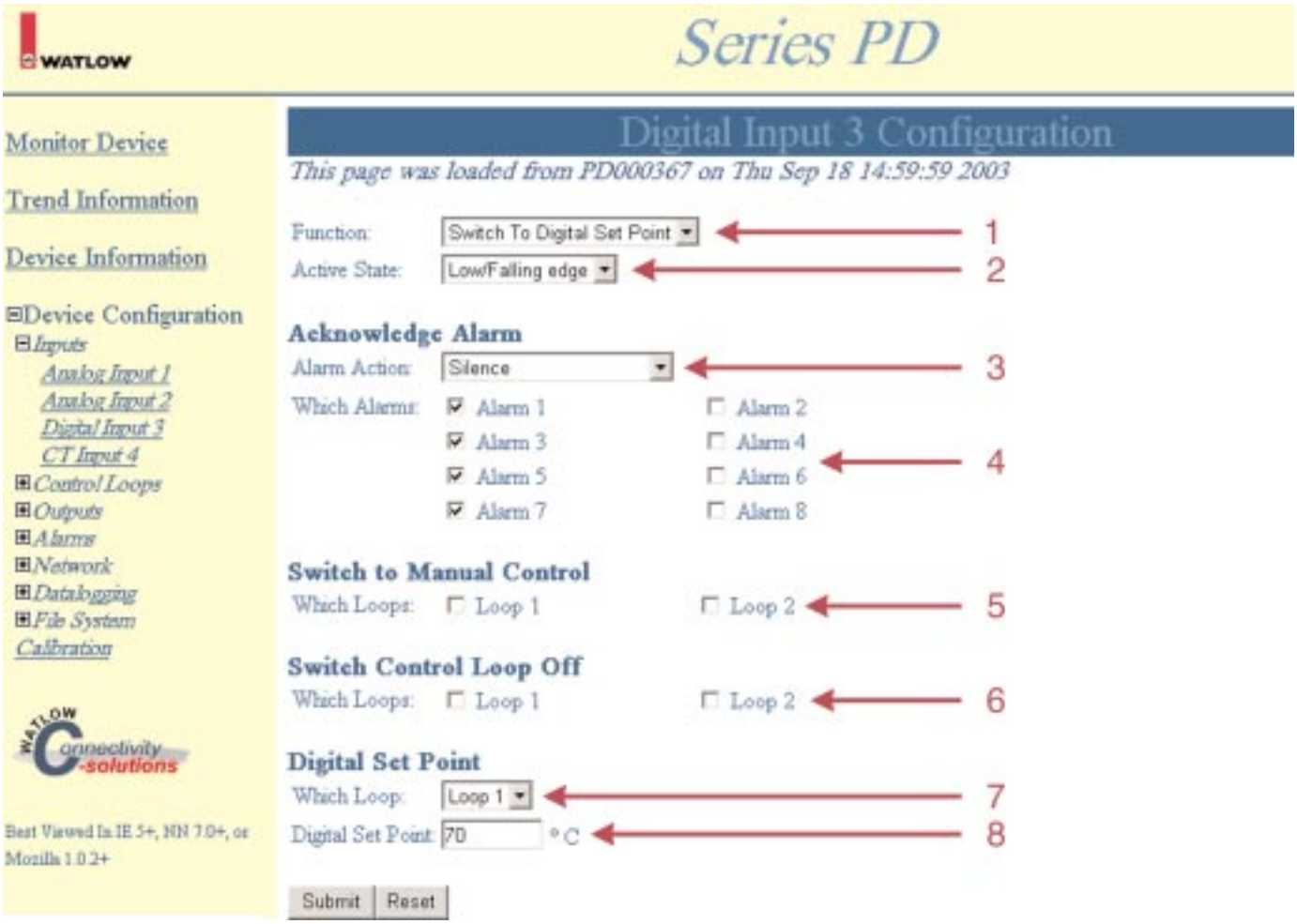


Figure 31 — Digital Input Configuration Web Page Example

Note: Red tag arrows and tag numbers are links to item descriptions. Click on a red tag arrow or number to go to a description of the item.

Tag #	Digital Input Configuration Parameters	Parameter Description
1.	**Function**	Selects the digital input function when the digital input active condition is satisfied. Off (disabled), Switch to Digital Set Point, Acknowledge Alarm(s), Switch to Manual Control, Switch Control Loop Off or Pause Data Logging.
2.	**Active State**	Selects the type of signal change required to trigger the digital input. Low/Falling Edge or High/Rising Edge.
Acknowledge Alarm		
3.	**Alarm Action**	Selects the alarm actions to be taken when the digital input active state is satisfied. Silence, Acknowledge or Silence and Acknowledge.
4.	**Which Alarms**	Sets the alarms that are affected by the alarm action setting. Alarm 1 through Alarm 8.
Switch to Manual Control		
5.	**Which Loops**	Sets the Control Loop that switches to Manual Control when the digital input active state is satisfied. Loop 1 or Loop 2.
Switch Control Loop Off		
6.	**Which Loops**	Sets the Control Loop that switches to Off (disabled) when the digital input active state is satisfied. Loop 1 or Loop 2.
Digital Set Point		
7.	**Which Loop**	Sets the Control Loop that switches to the Digital Set Point when the digital input active state is satisfied. Loop 1 or Loop 2.
8.	**Digital Set Point**	Sets the Digital Set Point used when the digital input active state is satisfied. Value must be within the set point range limits.

Figure 32 — Digital Input Web Page Tag Descriptions

CT (current transformer) Input Configuration Page

The CT input accepts a signal from a CT monitoring heater current. The CT develops an output signal proportional to the current flowing through the wire passing through the center hole of the CT. You can assign one or more alarm outputs to any CT input. The alarm can be configured to trip if the heater current gets too low or too high. The CT input cannot be used with a process output. See Features chapter.

Note: You must click Submit to send the new values to the Series PD.

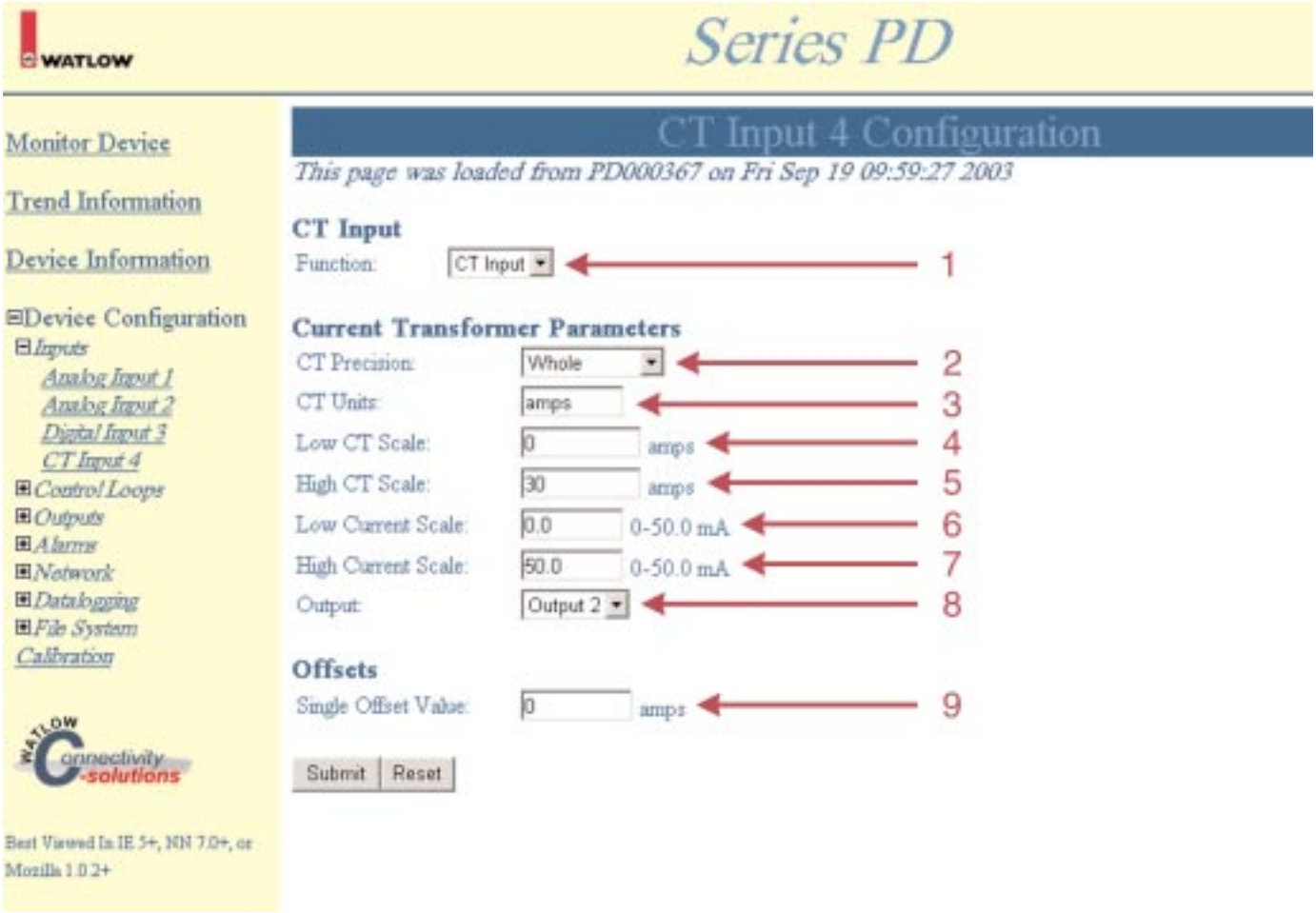


Figure 33 — CT(current transformer) Input Configuration Web Page Example

Note: Red tag arrows and tag numbers are links to item descriptions. Click on a red tag arrow or number to go to a description of the item.

Tag #	CT Input Configuration Parameters	Parameter Description
CT Input		
1.	**Function**	Turn the CT input on or off.
Current Transformer Parameters		
2.	**CT Precision**	Selects the decimal position for the CT input. 0, 0.0, 0.00 or 0.000.
3.	**CT Units**	Selects the CT units label displayed on the web page. Up to four alphanumeric characters.
4.	**Low CT Scale**	Sets the low value displayed with the minimum input signal. -30000 to 30000.
5.	**High CT Scale**	Sets the high value displayed with the maximum input signal. -30000 to 30000.
6.	**Low Current Scale**	Sets the minimum input signal value from the CT. 0.0 to 50.0.
7.	**High Current Scale**	Sets the maximum input signal value from the CT. 0.0 to 50.0.
8.	**Output**	Selects the output being monitored by the CT. Any output type, except a process output, can be assigned to a CT input. Mimimum on time required for valid CT readings. See Features chapter.
Offsets		
9.	**Single Offset Value**	Sets the offset value for the CT input signal. -9999 to 9999.

Figure 34 — CT Input Web Page Tag Descriptions

Control Loops

The Control Loops folder contains folders and links for configuring the control loops installed in the Series PD. The controller leaves the factory with default settings on the Loop Setting page that disable all output functions. To get the Series PD operational, you must go through the Loop Settings links and set up the control loops. The Loop folder links are:

- Loop Settings
- Multiple PID Sets

Note: Loop 2 folder appears on dual channel models only.

Loop Settings

The Control Loop Configuration page sets the parameters for the control loops installed. The control loop functions, input failure parameters, set point limits, on/off parameters, autotune start/stop, PID parameters and ramp to set point settings are configured on this page.

You can see and change all of the parameters on the Control Loop Configuration page. Only those that apply will be relevant. For example, you can set the On/Off Hysteresis even though you have the Loop Algorithms set to PID control. Only parameters relating to PID have any effect on the controller. If you change the Loop Algorithm to On/Off, the hysteresis values previously entered are used.

Note: You must click Submit to send the new values to the Series PD.

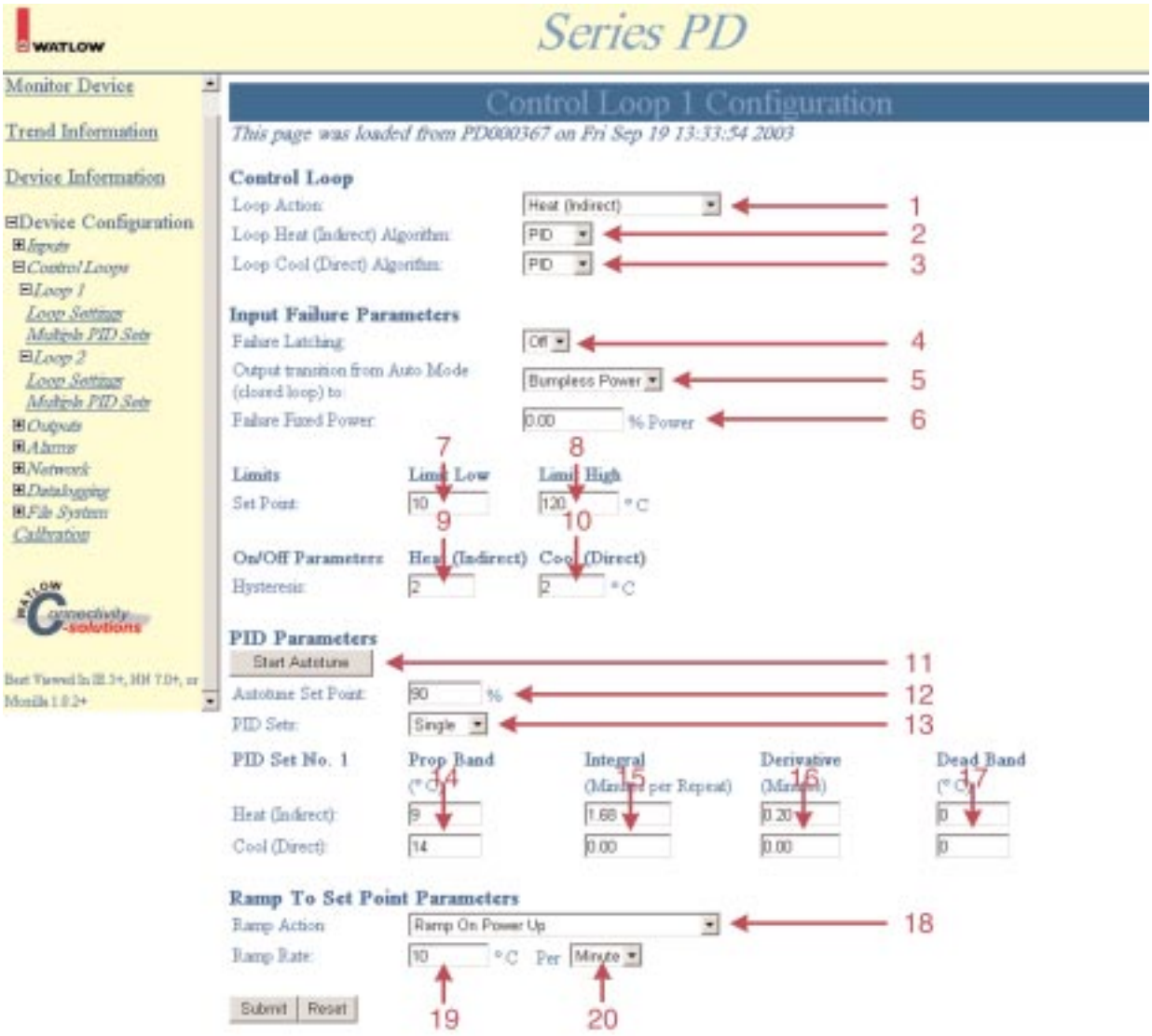


Figure 35 — Control Loop Configuration Web Page Example

Note: Red tag arrows and tag numbers are links to item descriptions. Click on a red tag arrow or number to go to a description of the item.

Tag #	Control Loop Configuration Parameters	Parameter Description
Control Loop		
1.	**Loop Action**	Sets the Control Loop output action Off (disabled), heat, cool or heat/cool.
2.	**Loop Heat (indirect) Algorithm**	Sets the Heat output method of control. PID or On/Off.
3.	**Loop Cool (direct) Algorithm**	Sets the Cool output method of control. PID or On/Off.
Input Failure Parameters		
4.	**Failure Latching**	Sets the input sensor failure latching action. Latching or Non-latching.
5.	**Output transition from Auto Mode to:**	Selects the controller's output mode upon input failure. Off (disabled), Bumpless Power or Fixed Power.
6.	**Failure Fixed Power**	Sets the fixed output power level for fixed output power level upon input failure. -100 to 100%.
Set Point Limits		
7.	**Low Limit**	Sets the minimum value for auto set point adjustment. Range depends upon sensor selected.
8.	**High Limit**	Sets the maximum value for auto set point adjustment. Range depends upon sensor selected.
On/Off Parameters		
9.	**Hysteresis Heat (indirect)**	Sets the switching differential when configured as On/Off method of control.
10.	**Hysteresis Cool (direct)**	Sets the switching differential when configured as On/Off method of control.
PID Parameters		
11.	**Start Autotune**	Start an autotune.
12.	**Autotune Set Point**	Sets the autotune set point as a percentage of the auto set point. 50 to 150%.
13.	**PID Sets**	Sets the PID capability for single or multiple PID sets.
14.	**PID Set 1, Proportional Band**	Sets proportional band value for PID Set 1.
15.	**PID Set 1, Integral**	Sets integral value for PID Set 1.
16.	**PID Set 1, Derivative**	Sets derivative value for PID Set 1.
17.	**PID Set 1, Dead Band**	Sets dead band value for PID Set 1.
Ramp to Set Point Parameters		
18.	**Ramp Action**	Selects the ramp to set point action for the single set point ramp function. Off (disabled), Ramp on Power Up, Ramp on Set Point Change, or Ramp on Power Up and Set Point Change.
19.	**Ramp Rate**	Sets the ramp rate for the ramp to set point function.
20.	**Ramp Rate Time Units**	Sets the ramp rate time units for the ramp to set point function. Ramp time in degrees/units per hour or per minute.

Figure 36 — Control Loop Web Page Tag Descriptions

Multiple PID Loop Configuration

The Multiple PID Loop Configuration page allows access to all of the PID sets for each loop available. You can see and change all of the parameters on the Multiple PID Loop Configuration page, but only those that apply will be relevant.

For example, you can set the Cool PID values even though the Series PD is set for heat PID control. Only parameters relating to heat PID values have any effect on the controller. If you change the Loop Action to Heat/Cool, the cool PID values previously entered are used.

Note: Multiple PID Loop 2 Configuration appears on dual channel models only.

Note: You must click Submit to send the new values to the Series PD.

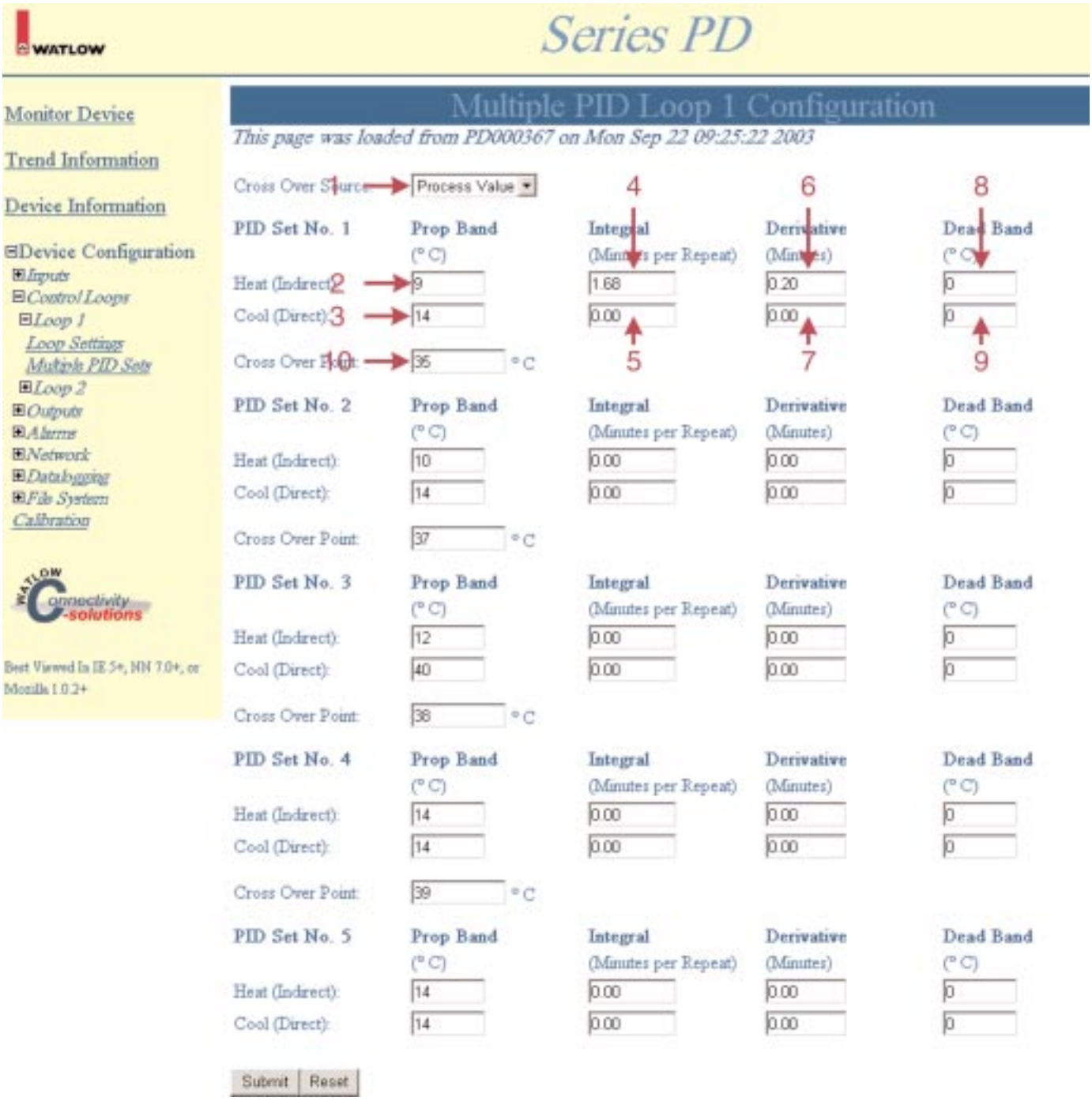


Figure 37 — Multiple PID Loop Configuration Web Page Example

Note: Red tag arrows and tag numbers are links to item descriptions. Click on a red tag arrow or number to go to a description of the item.

Tag #	Multiple PID Loop Configuration Parameters	Parameter Description
1.	**Cross Over Source**	Sets the source that triggers switching PID sets. Process or Set Point.
PID Set No. 1 - Prop Band		
2.	**Heat (indirect)**	Sets the proportional band value for the heat outputs.
3.	**Cool (direct)**	Sets the proportional band value for the cool outputs.
PID Set No. 1 - Integral		
4.	**Heat (indirect)**	Sets the integral value for the heat outputs.
5.	**Cool (direct)**	Sets the integral value for the cool outputs.
PID Set No. 1 - Derivative		
6.	**Heat (indirect)**	Sets the derivative value for the heat outputs.
7.	**Cool (direct)**	Sets the derivative value for the cool outputs.
PID Set No. 1 - Dead Band		
8.	**Heat (indirect)**	Sets the offset value of the heating proportional band from the set point.
9.	**Cool (direct)**	Sets the offset value of the cooling proportional band from the set point.
PID Set No. 1 - Cross Over Point		
10.	**Cross Over Point**	Sets the process or set point value where the PID sets cross over. Greater than or equal to this value activates this PID set. Must be within set point range limits.

Figure 38 — Multiple PID Loop Web Page Tag Descriptions

Outputs

The Outputs folder contains links for configuring the outputs installed in the Series PD. The controller leaves the factory with default settings on the Output pages that disable all output functions. To get the Series PD operational, you must go through the Output links and set up the outputs. The Outputs folder links are:

- Outputs 1
- Outputs 2
- Outputs 3
- Outputs 4

Process Output Configuration Page

The Process Output Configuration pages set the parameters for the process outputs installed. Outputs can be configured as control outputs, event (alarm) outputs or retransmit outputs. The Process Output Configuration page is shown below.

You can see and change all of the parameters on the Output Configuration page. Only those that apply will be relevant. For example, you can set the Retransmit Parameters even though you have the Control Function set to Control. Only parameters relating to control outputs have any effect on the controller. If you change the Output Function to Retransmit, the Retransmit Parameters previously entered are used.

Note: You must click Submit to send the new values to the Series PD.

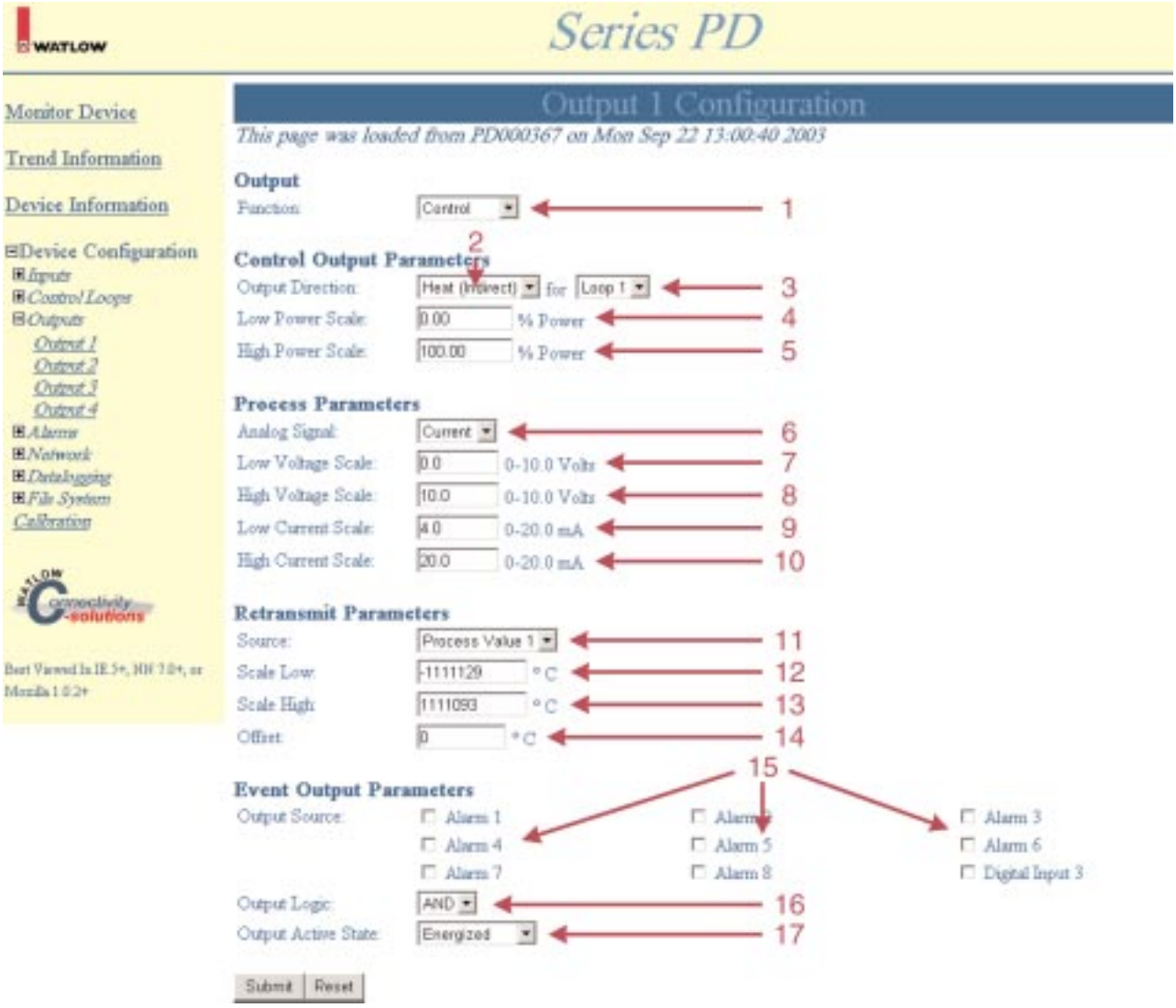


Figure 39 — Process Output Configuration Web Page Example

Note: Red tag arrows and tag numbers are links to item descriptions. Click on a red tag arrow or number to go to a description of the item.

Tag #	Process Output Configuration Parameters	Parameter Description
Output		
1.	**Function**	Selects the output function. Off (disabled), Control, Event or Retransmit
Control Output Parameters		
2.	**Output Direction**	Selects the output direction. Off (disabled), Heat or Cool
3.	**Loop**	Selects the control loop assigned to that output. Loop 1 or Loop 2. Loop 2 available on dual channel model only.
4.	**Low Power Scale**	Sets the minimum output power level available for the output. 0 to 100%.
5.	**High Power Scale**	Sets the maximum output power level available for the output. 0 to 100%.
Process Parameters		
6.	**Analog Signal**	Selects the type of analog signal for the output. Voltage or Current.
7.	**Low Voltage Scale**	Sets the minimum value for the voltage signal scaling. For example, if you want a 1-5 Vdc signal, set Low Voltage Scale to 1.
8.	**High Voltage Scale**	Sets the maximum value for the voltage signal scaling. For example, if you want a 1-5 Vdc signal, set Low Voltage Scale to 5.
9.	**Low Current Scale**	Sets the minimum value for the current signal scaling. For example, if you want a 4-20 mA signal, set Low Current Scale to 4.
10.	**High Current Scale**	Sets the maximum value for the current signal scaling. For example, if you want a 4-20 mA signal, set High Current Scale to 20.
Retransmit Parameters		
11.	**Source**	Selects what variable is represented by the retransmit signal. Process 1, Set Point 1, Process 2 or Set Point 2. Loop 2 parameters available on dual channel model only.
12.	**Scale Low**	Sets the value represented by the low voltage or current scale. For example, if you want a 1-5 Vdc signal to represent 30° to 100°C, set Scale Low to 30.
13.	**Scale High**	Sets the value represented by the high voltage or current scale. For example, if you want a 1-5 Vdc signal to represent 30° to 100°C, set Scale High to 100.
14.	**Offset**	Shifts the retransmit output signal up or down.
Event Output Parameters		
15.	**Output Source**	Selects what sources are assigned as inputs to the logic function. All alarm outputs and any digital inputs are available as input sources.
16.	**Output Logic**	Selects the logic function applied to the alarms and digital inputs selected. AND or OR logic.
17.	**Output Active State**	Selects the output state when the output is active. Energized or De-engergized.

Figure 40 — Process Output Configuration Web Page Tag Descriptions

Time Proportioned Output Configuration

The Time Proportioned Output Configuration page sets the parameters for the time proportioned outputs installed. Outputs can be configured as control outputs or event (alarm) outputs. A time proportioned output cycles on and off. The time the output is on versus off The Time Proportioned Output Configuration page is shown below.

You can see and change all of the parameters on the Output Configuration page. Only those that apply will be relevant. For example, you can set the Event Output Parameters even though you have the Output Function set to Control. Only parameters relating to control outputs have any effect on the controller. If you change the Output Function to Event, the Event Output Parameters previously entered are used.

Note: You must click Submit to send the new values to the Series PD.

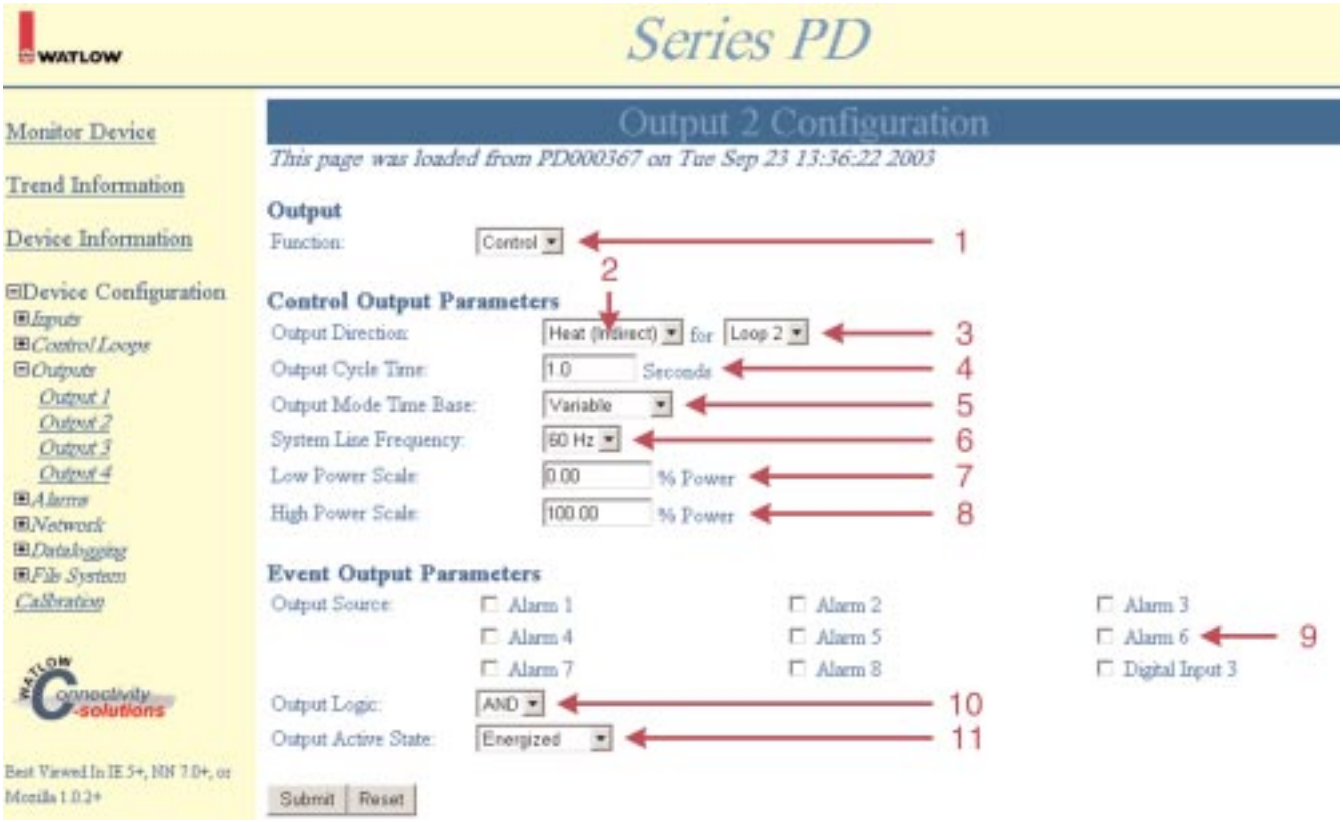


Figure 41 — Time Proportioned Output Configuration Web Page Example

Note: Red tag arrows and tag numbers are links to item descriptions. Click on a red tag arrow or number to go to a description of the item.

Tag #	Time Proportioned Output Configuration Parameters	Parameter Description
Output		
1.	**Function**	Selects the output function. Off (disabled), Control, Event or Retransmit
Control Output Parameters		
2.	**Output Direction**	Selects the output direction. Off (disabled), Heat or Cool
3.	**Loop**	Selects the control loop assigned to that output. Loop 1 or Loop 2. (Loop 2 available on dual channel model only)
4.	**Output Cycle Time**	Sets the time base used for fixed time base mode of operation.
5.	**Output Mode Time Base**	Selects the output mode of operation. Fixed time base, Variable time base or Single Cycle (only available with AC input power source).
6.	**System Line Frequency**	Selects the line frequency of the AC input power. 50 or 60 Hz.
7.	**Low Power Scale**	Sets the minimum output power level available for the output. 0 to 100%.
8.	**High Power Scale**	Sets the maximum output power level available for the output. 0 to 100%.
Event Output Parameters		
9.	**Output Source**	Selects what sources are assigned as inputs to the logic function. All alarm outputs and any digital inputs are available as input sources.
10.	**Output Logic**	Selects the logic function applied to the alarms and digital inputs selected. AND or OR logic.
11.	**Output Active State**	Selects the output state when the output is active. Energized or De-engergized.

Figure 42 — Time Proportioned Output Configuration Web Page Tag Descriptions

Alarms

The Alarms folder contains links for configuring the eight alarms available on the Series PD. The controller leaves the factory with default settings on the Alarms Configuration page that disable all alarm functions. To get the Series PD alarms operational, you must go through the Alarms links and set them up. The Alarms folder links are:

- Alarm 1 thru Alarm 8

Alarm Configuration Page

The Alarm Configuration pages set up the alarm functions. Alarms can be configured as process, deviation or current alarms. The Series PD can also be configured to send out an e-mail when an alarm occurs.

You can see and change all of the parameters on the Alarm Configuration page. Only those that apply will be relevant. For example, you can set the Deviation Alarm Parameters even though you have the Alarm Type set to Low Process. Only parameters relating to the Process Alarm have any effect on the controller. If you change the Alarm Type to High Deviation, the Deviation Alarm Parameters previously entered are used.

Note: You must click Submit to send the new values to the Series PD.

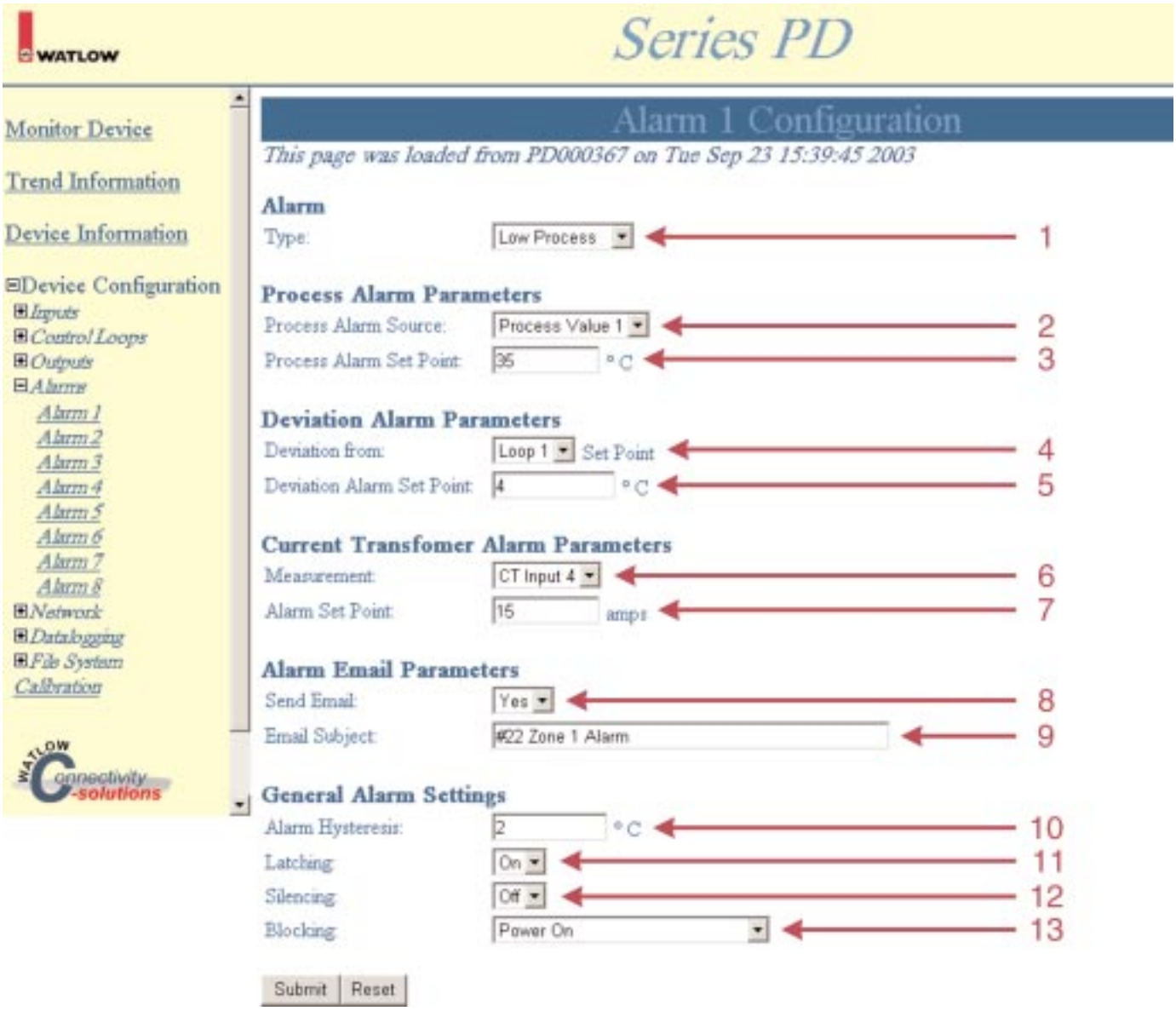


Figure 43 — Alarm Configuration Web Page Example

Note: Red tag arrows and tag numbers are links to item descriptions. Click on a red tag arrow or number to go to a description of the item.

Tag #	Alarm Configuration Parameters	Parameter Description
Alarm		
1.	**Type**	Selects the type of alarm. Off (disabled), Low Process, High Process, Low Deviation, High Deviation, CT Low Alarm or CT High Alarm.
Process Alarm Parameters		
2.	**Process Alarm Source**	Selects the input assigned to the process alarm. Process Value 1 or Process Value 2. Loop 2 available on dual channel model only.
3.	**Process Alarm Set Point**	Sets the value at which the alarm is triggered.
Deviation Alarm Parameters		
4.	**Deviation from Loop Set Point**	Selects the Loop the deviation set point is based on. Loop 1 or Loop 2. Loop 2 available on dual channel model only.
5.	**Deviation Alarm Set Point**	Sets the value at which the alarm is triggered.
Current Transformer Alarm Parameters		
6.	**Measurement**	Selects the source of the current transformer measurement. CT Input 3 or CT Input 4.
7.	**Alarm Set Point**	Sets the value at which the alarm is triggered.
Alarm Email Parameters		
8.	**Send Email**	Selects if an email gets sent when the alarm is triggered. No or Yes.
9.	**Email Subject**	Sets the text message displayed in the subject line of the alarm email. Enter up to 30 alphanumeric characters.
Alarm Email Parameters		
10.	**Alarm Hysteresis**	Sets the switching differential for the alarm output.
11.	**Latching**	Selects if alarm latching is enabled. No or Yes.
12.	**Silencing**	Selects if alarm silencing is enabled. No or Yes.
13.	**Blocking**	Selects if alarm blocking is enabled. No or Yes.

Figure 44 — Alarm Configuration Web Page Tag Descriptions

Network

The Network folder contains links for configuring the network settings. The Network folder links are:

- TCP/IP Settings
- Email
- Security

Network Configuration Page

The Network Configuration page provides access to important information about your network and Series PD network settings. Be sure to work with your network administrator when configuring the Series PD to operate on your network.

Note: You must click Submit to send the new values to the Series PD.

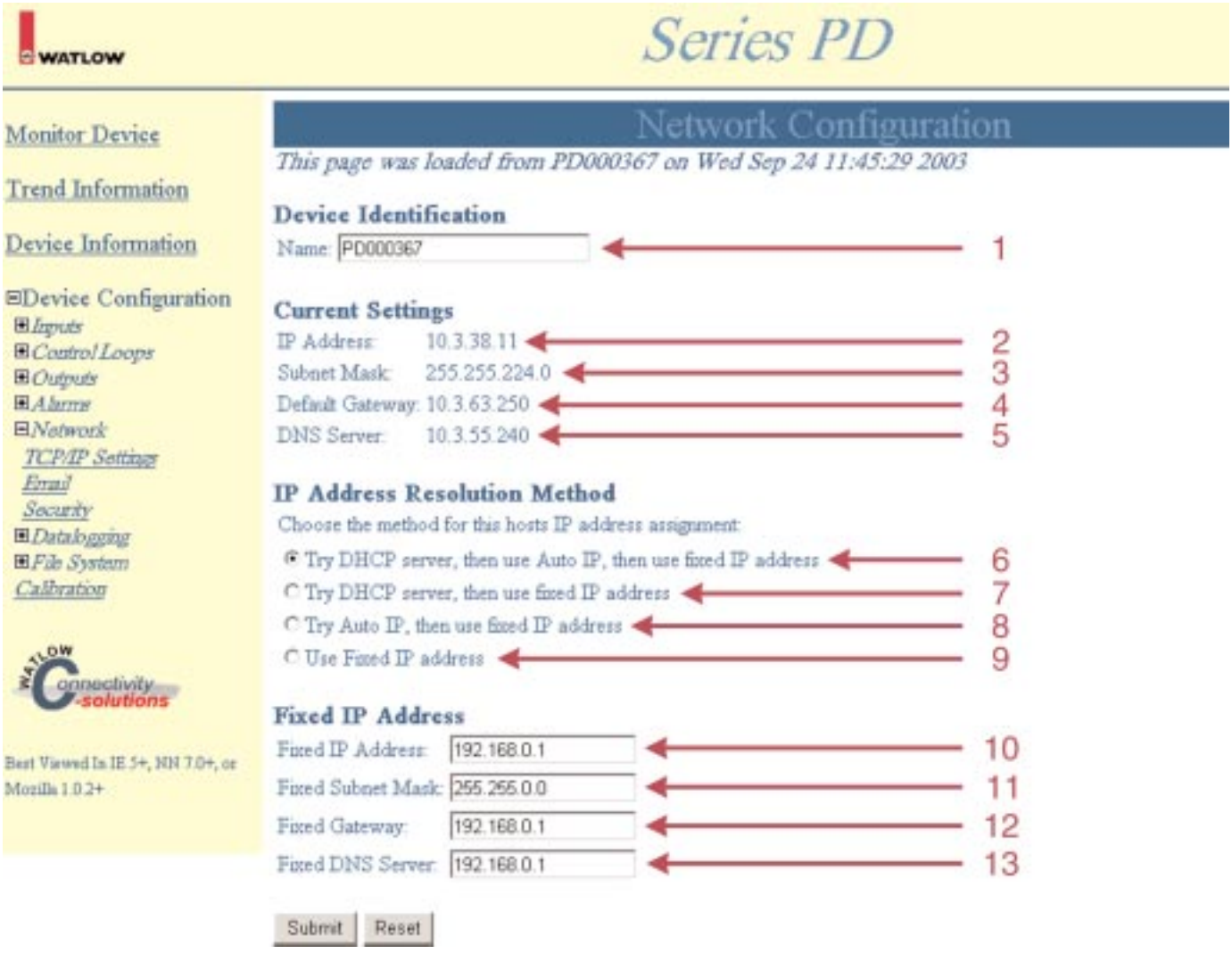


Figure 45 — Network Configuration Web Page Example

Note: Red tag arrows and tag numbers are links to item descriptions. Click on a red tag arrow or number to go to a description of the item.

Tag #	Network Configuration Parameters	Parameter Description
Device Identification		
1.	**Name**	Sets the Netbios name.Enter up to 15 alphanumeric characters. Valid characters are: 0-9, A-Z, a-z, and "-". The default device name is PDXXXXXX, where XXXXXX is the serial number. Not all computer networking configurations support Netbios names.
Current Settings		
2.	**IP Address**	Displays current IP address number. Series PD supports DHCP client, AutoIP and Fixed IP address assignment.
3.	**Subnet Mask**	Displays current subnet mask.
4.	**Default Gateway**	Displays current default gateway.
5.	**DNS Server**	Displays current DNS server.
IP Address Resolution Method		
6.	**Try DHCP, AutoIP, then Fixed IP**	Sets the IP address resolution method to try DHCP first. If unsuccessful, try AutoIP next and finally Fixed IP to get an IP address.
7.	**Try DHCP, then Fixed IP**	Sets the IP address resolution method to try DHCP first. If unsuccessful, try Fixed IP to get an IP address.
8.	**Try AutoIP, then Fixed IP**	Sets the IP address resolution method to try AutoIP first. If unsuccessful, try Fixed IP to get an IP address.
9.	**Fixed IP**	Sets the IP address resolution method to Fixed IP to get an IP address.
Fixed IP Address		
10.	**Fixed IP**	Fixed IP address, if entered.
11.	**Subnet Mask**	Fixed subnet mask, if entered.
12.	**Default Gateway**	Fixed default gateway, if entered.
13.	**Fixed DNS Server**	Fixed DNS server, if entered.

Figure 46 — Network Configuration Web Page Tag Descriptions

Email Configuration Page

The Email Configuration page sets up the email capabilities for the Series PD. Alarms can be configured to send out an email when the alarm trips. Be sure to work with your network administrator when configuring the Series PD email functions to operate on your network..

Note: You must click Submit to send the new values to the Series PD.

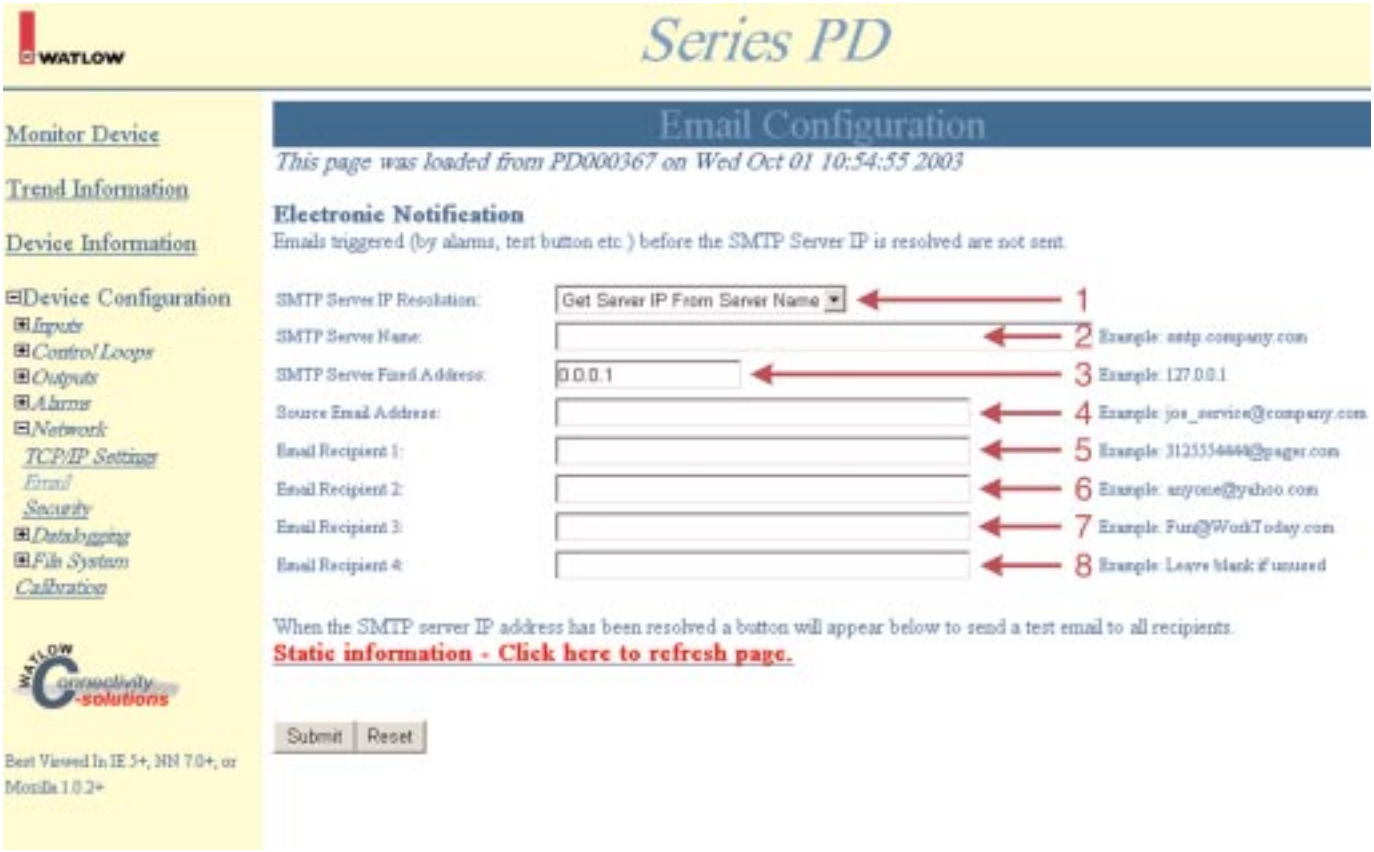


Figure 47 — Email Configuration Web Page Example

Note: Red tag arrows and tag numbers are links to item descriptions. Click on a red tag arrow or number to go to a description of the item.

Tag #	Email Configuration Parameters	Parameter Description
Electronic Notification		
1.	**SMTP Server IP Resolution**	Selects the method of SMTP server IP address resolution. Get Server IP from Server Name or Fixed Server Address.
2.	**SMTP Server Name**	Sets the SMTP server name.
3.	**SMTP Server Fixed Address**	Sets the SMTP server fixed IP address.
4.	**Source Email Address**	Sets the email address sending the email.
5.	**Email Recipient 1**	Sets the destination email address. You may send an email to four independent email addresses.
6.	**Email Recipient 2**	Sets the destination email address. You may send an email to four independent email addresses.
7.	**Email Recipient 3**	Sets the destination email address. You may send an email to four independent email addresses.
8.	**Email Recipient 4**	Sets the destination email address. You may send an email to four independent email addresses.

Figure 48 — Email Configuration Web Page Tag Descriptions

Security Configuration Page

The Security Configuration page sets up four independent levels of access for the Series PD. The four security levels are:

- No Security-Read only access to the Monitor Device page. The Device Information page is a read only page.
- Monitor-Read/write access to the Monitor Device page. The Device Information page is a read only page.
- Configuration-Read/write access to the Monitor Device page and all Device Configuration pages. The Device Information page is a read only page.
- Administration-Full read/write access to all pages. The Device Information page is a read only page.

Accessing any level except no security, requires the user to login. The Monitor, Configuration and Administration security levels each have independent user names and passwords. The default user name and password for all three levels is:

user name - ***new***

password - ***user***

The login screen contains a check box to save your password in your password list. If you check this box, you will only need to enter this information once. If you close the browser, you will be required to enter this information again. An incorrect or cancelled login attempt will also require the user to type in the correct information again.

Note: Be sure to change the default user names and passwords if device security is important in your application.

Note: You must click Submit for each security level to send the new user name and password information to the Series PD.

Figure 49 — Security Configuration Web Page Example

Note: Red tag arrows and tag numbers are links to item descriptions. Click on a red tag arrow or number to go to a description of the item.

Tag #	Security Configuration Parameters	Parameter Description
Security Level		
1.	**Monitor**	Read/Write access to the Monitor Device page. The Device Information page is a read only page.
2.	**Configuration**	Read/write access to the Monitor Device page and all Device Configuration pages. The Device Information page is a read only page.
3.	**Administration**	Full read/write access to all pages. Read/write access to Monitor Device page, all Device Configuration pages, Web View Configuration page, Security Configuration page, Network Configuration page, Email Configuration page and all Calibration pages. The Device Information page is a read only page.

Figure 50 — Security Configuration Web Page Tag Descriptions

Datalogging

The Datalogging folder contains links for configuring the datalogging functions. The controller leaves the factory with datalogging disabled. To get the Series PD datalogging operational, you must go through the Datalogging links and set up it up. The Datalogging folder links are:

- Settings
- Clock

Note: Datalogging folder only appears on models with datalogging capabilities.

Datalog Configuration Page

The Datalog Configuration page sets up what parameters get logged, the time interval for logging the data and what to do with the data once it has been logged.

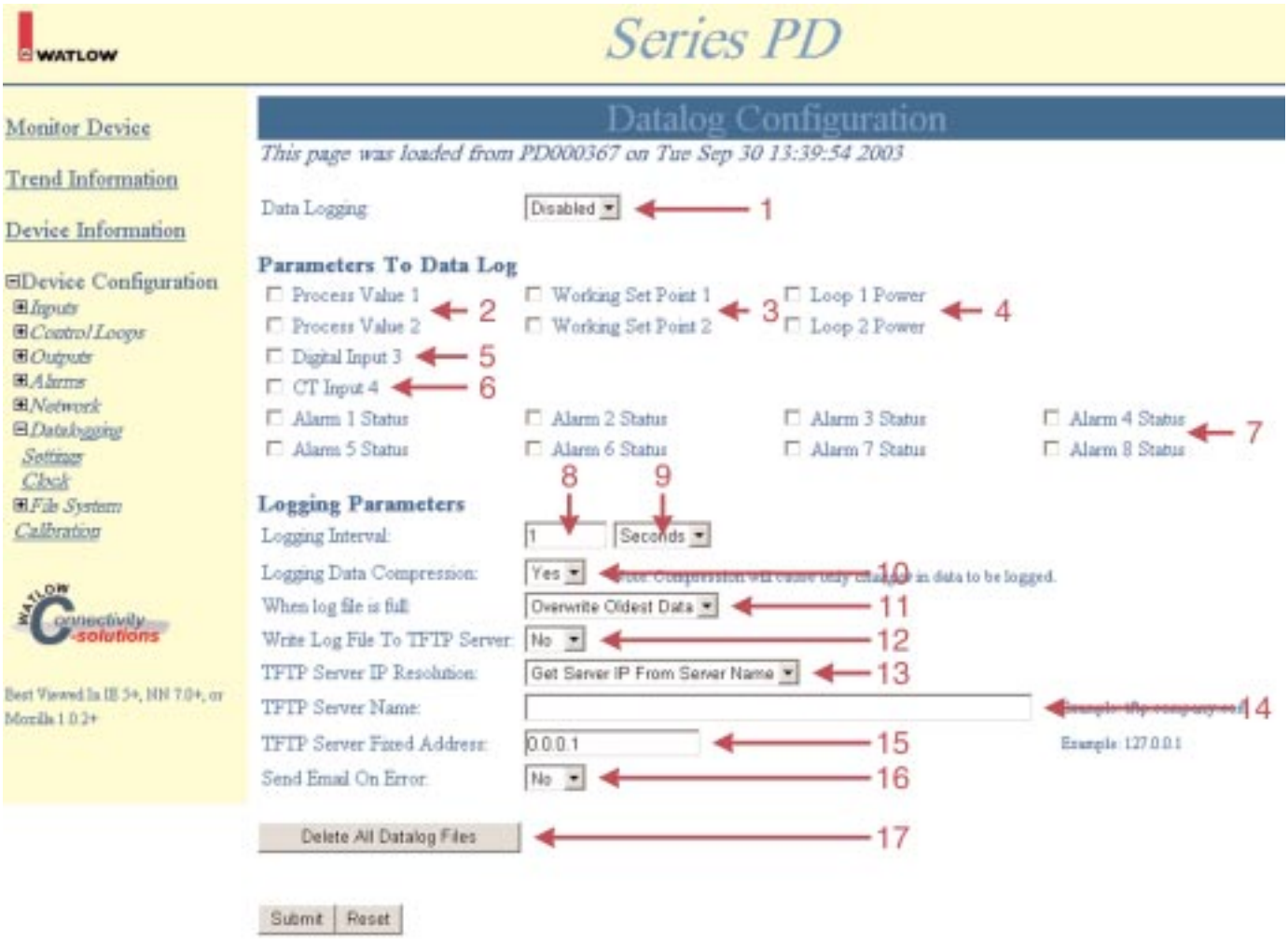


Figure 51 — Datalog Configuration Web Page Example

Note: Red tag arrows and tag numbers are links to item descriptions. Click on a red tag arrow or number to go to a description of the item.

Tag #	Datalog Configuration Parameters	Parameter Description
1.	**Datalogging**	Activate the datalogging function. Enable or Disable.
Parameters to Datalog		
2.	**Process Value 1 and 2**	Selects the analog input values for Input 1 and Input 2 to be logged. Input 2 only appears on dual channel models.
3.	**Working Set Point 1 and 2**	Selects the active set point values for Input 1 and Input 2 to be logged. Input 2 only appears on dual channel models. The working set point could be one of several set point sources, Auto Set Point, Digital Set Point or Ramp to Set Point.
4.	**Loop Power 1 and 2**	Selects the output power level values for Loop 1 and Loop 2 to be logged. Loop 2 only appears on dual channel models.
5.	**Digital Input 3 and 4**	Selects the digital input status for Input 3 and Input 4 to be logged. These only appear on models where the digital inputs are installed.
6.	**Current Transformer (CT) Input 3 and 4**	Selects the current transformer input value for Input 3 and Input 4 to be logged. These only appear on models where the digital inputs are installed.
7.	**Alarm 1-8 Status**	Selects the alarm status for Alarms 1-8 to be logged.
Logging Parameters		
8.	**Logging Interval Time**	Sets the time interval for logging the selected data. 1 to 200.
9.	**Logging Interval Units**	Selects the time units for the interval time for logging the selected data. Seconds or Minutes.
10.	**Logging Data Compression**	Selects the data compression function. With data compression enabled, parameter values only get logged if the value has changed. Yes or No.
11.	**When log file is full**	Selects the action the Series PD should take when a log file gets full. Stop Logging or Overwrite Oldest Data.
12.	**Write Log File to TFTP Server**	Enables the Series PD to transfer logged information to a TFTP (trivial file transfer protocol) server. Yes or No.
13.	**TFTP Server IP Resolution**	Selects the method for assigning the TFTP server IP address. Get Server IP from Server Name or Fixed Server Address.
14.	**TFTP Server Name**	Sets the TFTP server name used for assigning an IP address.
15.	**TFTP Server Fixed Address**	Sets the TFTP server fixed IP address.
16.	**Send Email on Error**	Enables email to be sent if TFTP server is unavailable for upload.
17.	**Delete All Datalog File**	Deletes all datalog files currently stored in the Series PD. Be sure you have transferred any files you want to keep.

Figure 52 — Datalog Configuration Web Page Tag Descriptions

Clock Configuration Page

The Clock Configuration page sets up time, date and time server synchronization data. A time server is an application that periodically goes out to a time standard.

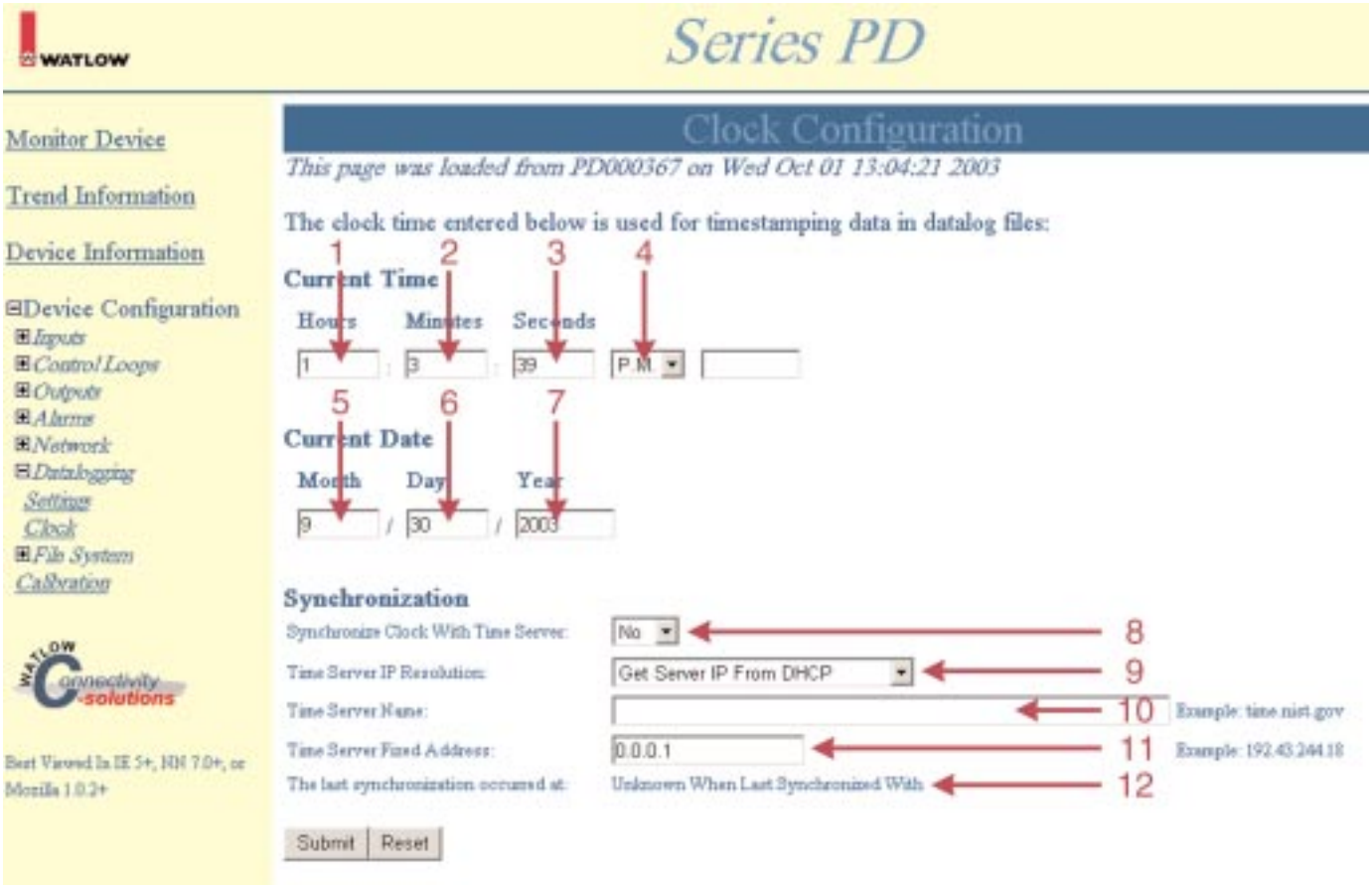


Figure 53 — Datalog Configuration Web Page Example

Note: Red tag arrows and tag numbers are links to item descriptions. Click on a red tag arrow or number to go to a description of the item.

Tag #	Clock Configuration Parameters	Parameter Description
Current Time		
1.	**Hours**	Sets the hours for the current time, 1 - 12 hours.
2.	**Minutes**	Sets the minutes for the current time. 0 - 60 minutes.
3.	**Seconds**	Sets the seconds for the current time. 0-60 seconds.
4.	**A.M. / P.M.**	Sets A.M. or P.M. for the current time.
Current Date		
5.	**Month**	Sets the month for the current date. 1 - 12
6.	**Day**	Sets the day for the current date. 1 - 31.
7.	**Year**	Sets the year for the current date. 2000 - 2099.
Synchronization		
8.	**Synchronize Clock with Time Server**	Enables the Series PD to synchronize its clock with a time server. No or Yes.
9.	**Time Server IP Resolution**	Selects the IP resolution method for the time server. Get Server IP from DHCP, Get Server IP from Server Name or Fixed Server Address.
10.	**Time Server Name**	Enter the time server name.
11.	**Time Server Fixed Address**	Enter the time server fixed IP address.
12.	**The Last Synchronization Occurred at:**	Displays time and date of the last clock synchronization.

Figure 54 — Datalog Configuration Web Page Tag Descriptions

File System

The File System folder contains links for working with the datalogging files and the Series PD web page appearance. The File System links are:

- File Manager
- Web View

Note: File System folder only appears on models with datalogging capabilities.

File Manager Page

The File Manager page provides a list of all the files stored in the Series PD. Basic file operations, like viewing, deleting and saving files, are performed on this page.

The Series PD on-board storage is divided into two sections:

- Storage Device 0 for all datalog files.
- Storage Device 1 for other files like operating instructions, cascade style sheets, custom logos, system diagrams, contact information, links to web sites, etc. Files with .htm or html extensions will create hot links at the bottom of the Navigation Frame.

To view a file, click on the file name.

To delete selected files, click the check box of the files to delete and click on the Delete Selected button for that Storage Device. **Be sure to save any data you want to keep to another location before deleting files from the Series PD. Once data is deleted, it cannot be recovered.**

To delete all stored files, click on Clear Entire File System button. This clears all data stored in the Series PD on-board memory.

To save a file, right mouse click on the file and save to another location.

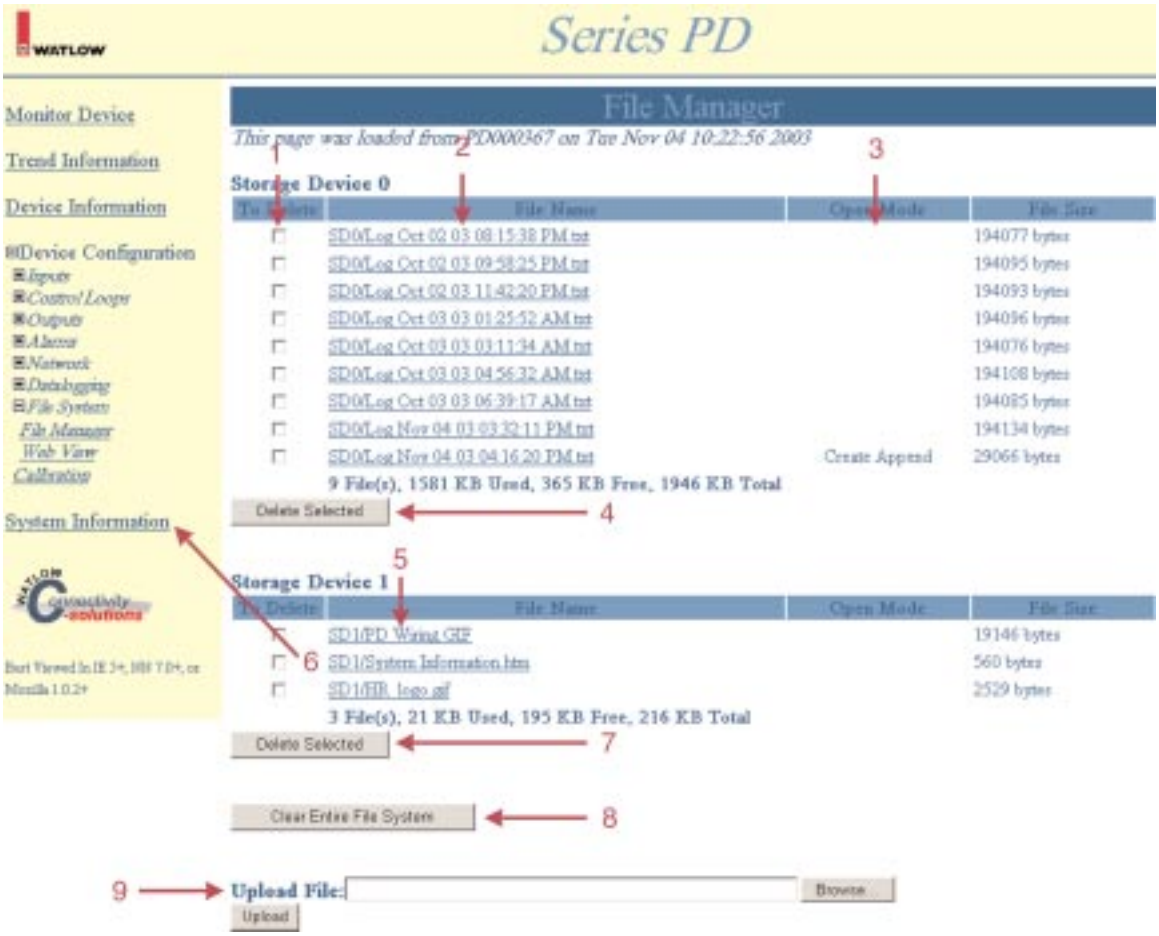


Figure 55 — File Manager Web Page Example

Note: Red tag arrows and tag numbers are links to item descriptions. Click on a red tag arrow or number to go to a description of the item.

Tag #	File Manager Parameters	Parameter Description
1.	**To Delete**	Check box to select files for deletion from on-board file storage.
2.	**File Name (datalog files)**	Displays datalog files currently in Series PD file storage, SD0. The file name contains the date and time the datalog file was started. The maximum file size is 190k bytes, with a maximum of 10 files.
3.	**Open Mode**	If column is blank, the datalog file is closed and can be opened or deleted. If Create Append appears, data is being written to the file and the file cannot be opened or deleted until the file is closed.
4.	**Delete Selected (Storage Device 0)**	Click this button to delete selected datalog files.
5.	**File Name**	Displays files currently in Series PD file storage, SD1. Use this location to store any type of files. For example, system wiring diagrams, operating instructions, cascade style sheets, custom logos, contact information, links to web sites, etc. The maximum file size is 21k bytes, with a maximum of 10 files.
6.	**Navigation Frame Link**	Files with .htm or .html extensions create a link in the lower section of the web page Naviagation Frame. Click on this link to open the file in the browser window.
7.	**Delete Selected (Storage Device 1)**	Click this button to delete selected files.
8.	**Clear Entire File System**	Click this button to delete all datalog files.
9.	**Upload Files**	Send files to SD1 storage. Browse to select the file to load to the Series PD and click Upload. A pop-up window indicates the file transfer is in process and confirms the transfer is complete.

Figure 56 — File Manager Web Page Tag Descriptions

Web View Page

The Web View page allows customization of the Series PD web page appearance. The logo in the upper left corner and the name in the middle of the banner at the top of each web page can easily be customized. In addition, cascade style sheets can alter the web page attributes such as colors, fonts, text size, etc.

Note: You must click Submit to send the new information to the Series PD.

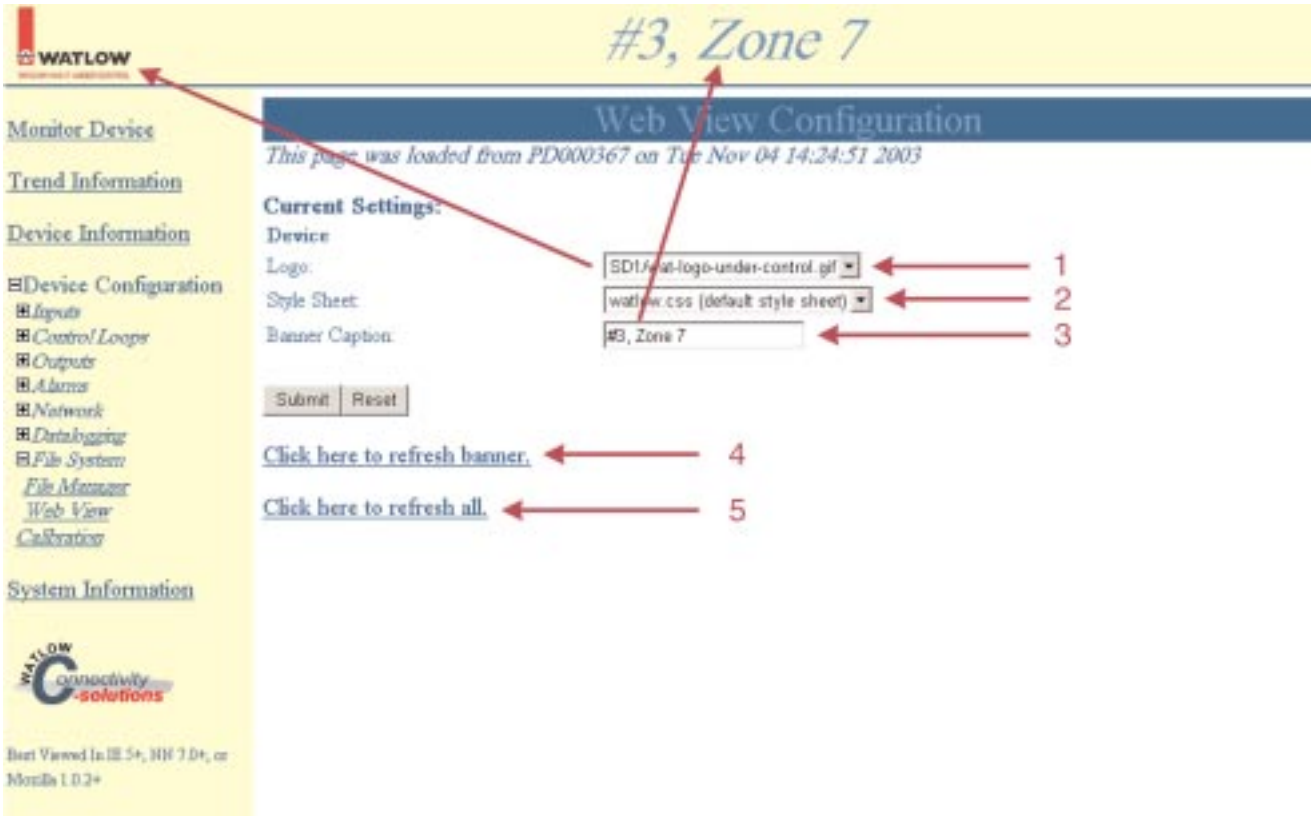


Figure 57 — Web View Web Page Example

Note: Red tag arrows and tag numbers are links to item descriptions. Click on a red tag arrow or number to go to a description of the item.

Tag #	Web View Parameters	Parameter Description
1.	**Logo**	Select the file name for the logo appearing in the upper left corner of the banner at the top of each web page. The logo files can be stored in the Storage Device 1 location of the Series PD or can be located at an external URL. The logo must be a .gif or .jpg file.
2.	**Style Sheet**	Select the style sheet file (.css) to be applied to the Series PD web pages. Style sheets define fonts, font sizes, colors, logo location and other web page attributes. The style sheet files can be stored in the Storage Device 1 location of the Series PD or can be located at an external URL.
3.	**Banner Caption**	Enter up to 10 alphanumeric characters that appear in the center of the banner at the top of each Series PD web page. For example, #3, Zone 7.
4.	**Click here to refresh banner**	Click this button to refresh the logo and name appearing in the banner at the top of the Series PD web pages.
5.	**Click here to refresh all**	Click this button to refresh all of the Series PD web pages attributes.

Figure 58 — Web View Web Page Tag Descriptions

8 Calibration Page

The Series PD Calibration web page provides access to calibrate any analog inputs or outputs installed. It also allows restoring factory calibration values, restoring control configuration defaults, and saving or restoring user settings. These are not typical operator functions and access to this page can be limited by going to **Device Configuration > Network > Security.** The Administration Security Level is the only level with access to the Calibration page.

Note: You must enter the Administration Security Level user name and password to access the Calibration web page.

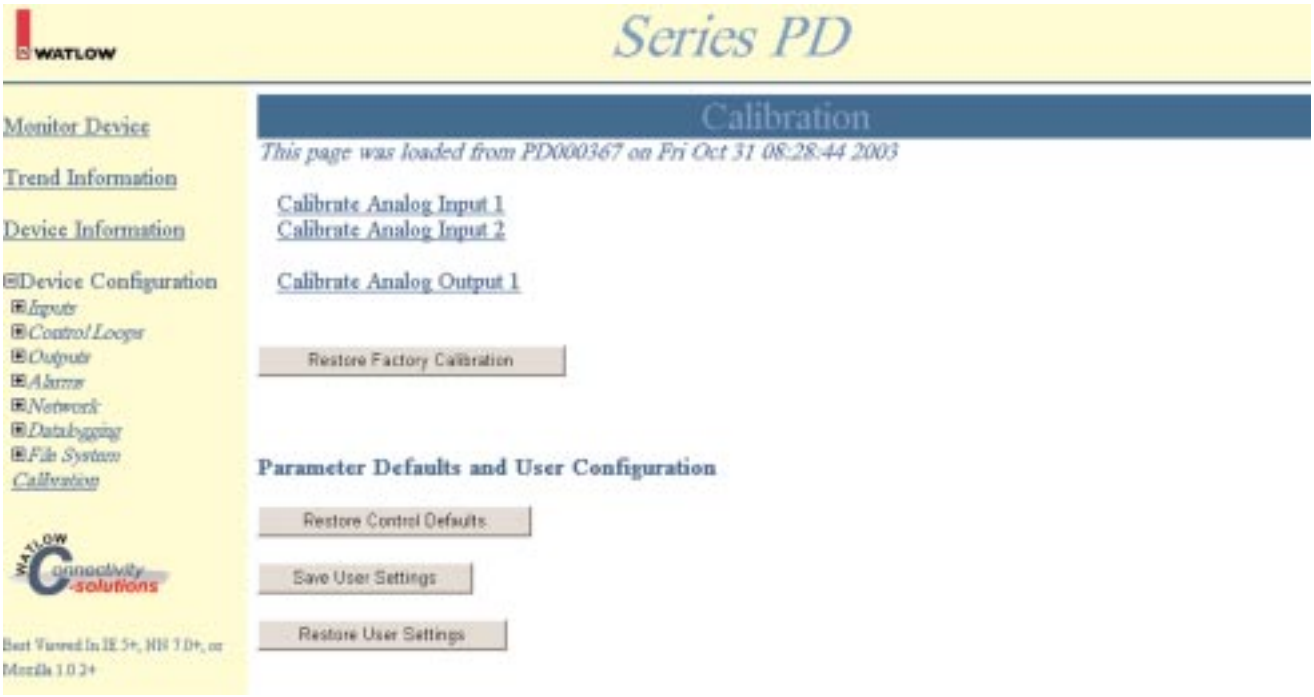


Figure 59 — Calibration Web Page Example

Restoring Factory Calibration

If the Factory Calibration gets corrupted, the Restore Factory Calibration function restores all of the original factory calibration values for all analog inputs and outputs. To perform a calibration restore, go to **Device Configuration > Calibration** and click on the **Restore Factory Calibration** button.

Restoring Control Defaults

To set all controller parameter values back to factory default settings, go to **Device Configuration > Calibration** and click on the **Restore Control Defaults** button.

Note: Allow six seconds for all of the parameter settings to get set back to factory defaults values.

Save and Restore User Settings

Recording all the Series PD parameter settings for future reference is very important. If the settings get unintentionally changed, you will need to program the correct settings back into the controller to return the equipment to operational condition.

After you program the controller and verify proper operation, save the settings into a special section of memory. To save all user settings, go to **Device Configuration > Calibration** and click on the **Save User Settings** button.

If the settings in the controller get changed and you want to restore the last saved user settings, go to **Device Configuration > Calibration** and click on the **Restore User Settings** button.

Note: Only perform the Save User Settings procedure when you are sure that all the correct settings are programmed into the controller. Saving the settings overwrites any previously saved collection of settings. Be sure to document all controller settings.

Calibrating the Series PD

Warm up the Series PD for 20 minutes. To reach the Calibration web page, go to **Device Configuration > Calibration.** The Enter Network Password box appears and you are prompted to enter Network Password information. The default User Name is ***new*** and Password is ***user***.

Be sure to change your user name and password if controller security is a concern. If you want your browser to remember the User Name and Password after you enter it the first time, check the box, Save this password in your password list. If you close your browser, you must re-enter your user name and password information.

⚠ Caution: Before performing a calibration, all control loops should be disabled. Go to Device Configuration > Control Loops > Loop 1 or 2 > Loop Settings > Control Loop Action, and set to Off.

Equipment Required

- 4 1/2 digit millivolt meter
- 4 1/2 digit milliammeter
- Precision millivolt source, 0 to 50 mV minimum range, 0.002 mV resolution.
- Precision current source, 0 to 20 mA range, with 0.01 mA resolution.
- 1 kΩ decade box with 0.01Ω resolution.

Calibrate Analog Input x (1 or 2)

1. Select Calibrate Analog Input x
2. Select Millivolts Low (-5 mV)
3. Connect appropriate value to input terminals. See Chapter 2 for wiring.
4. Measure value to 3 decimal places and enter value in box.
5. Click on the Calibrate button.
6. Select Millivolts High (20 mV)
7. Repeat steps 3 through 5.
8. Select Ohms Low (90.85 Ohms)
9. Repeat steps 3 through 5.
10. Select Ohms High (346.66 Ohms)
11. Repeat steps 3 through 5.
12. Select Milliamps Low (0 mA)
13. Repeat steps 3 through 5.
14. Select Milliamps High (15 mA)
15. Repeat steps 3 through 5.
16. Select Volts Low (0 V)
17. Repeat steps 3 through 5.
18. Select Volts High (10.0 V)
19. Repeat steps 3 through 5.
20. Select Go Back To Calibration Page.
21. Verify calibration and rewire for operation.

Calibrate Analog Output x (1 or 3)

To reach the Calibration web page, go to **Device Configuration > Calibration.** The Enter Network Password box appears and you are prompted to enter Network Password information. The default User Name is ***new*** and Password is ***user***.

1. Select Calibrate Analog Output x
2. Select Low Volts
3. Click on Apply Signal
4. Measure actual output signal to 3 decimal places at appropriate output terminals and enter value in box.
5. Click on Calibrate
6. Select Go Back To Calibration Page
7. Select High Volts
8. Repeat steps 3 through 6
9. Select Low Milliamps
10. Repeat steps 3 through 6
11. Select High Milliamps
12. Repeat steps 3 through 6
13. Select Go Back To Calibration Page.
14. Verify calibration and rewire for operation.

9 Parameter Tables

These tables contain detailed information for the all of the parameters contained in Series PD controller. The tables consist of six fields for each parameter listed. These are:

- Parameter Name and Description - name of the parameter and a brief description. Some functions may have more detailed information available in the Features chapters
- Web Page - web page the parameter appears on.
- Settings - blank column to allow you to document your Series PD settings.
- Range - numeric range or selection choices.
- Default - factory default values.
- Modbus - Modbus register numbers, the read/write status and the scaling factor of the Modbus value.

The parameters are grouped together by function and are in the order that they appear on the web pages. Use the search function to find a specific parameter.

Modbus

Read/Write Status - Some parameters list the read/write status only, no Modbus register numbers. These parameters are available through the web pages only.

Modbus Registers - Some parameter values are four byte integers and require two Modbus registers. The low register number contains the two higher bytes and the high register number contains the two lower bytes.

To read 32-bit values:

The process value of the Series PD is contained in two registers. For example, register 31 contains the two higher bytes while register 32 contains the two lower bytes. The 16-bit value returned from register 31 is multiplied by 65535 and added to register 32 when working in decimal format. To place the decimal point, divide the results by 1000.

To write 32-bit values:

The setpoint value of the Series PD is contained in two registers. For example, register 76 contains the two higher bytes, while register 77 contains the two lower bytes. The reverse of a read has to be performed. To write a setpoint of 1250 degrees (which is really 1250.000) multiply the setpoint value (SP) by 1000. Add 65536 to negative numbers. This produces the setpoint (SP) we want to send. To determine the most significant word (MSW), divide the SP by 2^{16} or 65536. To determine the least significant word (LSW), subtract from the SP the result of multiplying the MSW by 2^{16}.

SP = 1250 * 1000 = 1250000

MSW = 1250000 / 2^16 = 19

LSW = 1250000 - (19 * 2^16) = 4816

Scaling Factor - Multiplier or divisor for the parameter value.

Decimal Precision - Decimal precision is implied at three decimal places for integer values unless otherwise noted.

All values used by the Series PD are integer values. Go to http://www.modbus.org for detailed information on the Modbus TCP protocol.

Device Configuration > Inputs > Analog Inputs 1 and 2, CT Inputs 3 and 4

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Analog Input 1 - Process Value Display analog input unfiltered process value.	Monitor Device Trend Information		-2000000200 to 2000000200 degrees or units		31-32 (R) (/1000)
Analog Input 2 - Process Value Display analog input unfiltered process value.	Monitor Device Trend Information		-2000000200 to 2000000200 degrees or units		43-44 (R) (/1000)
Analog Input 3 - Process Value Display analog input unfiltered process value.	Monitor Device Trend Information		-2000000200 to 2000000200 units		(R)
Analog Input 4 - Process Value Display analog input unfiltered process value.	Monitor Device Trend Information		-2000000200 to 2000000200 units		(R)
Analog Input 1 - Filtered Process Value Display analog input filtered process value.	Monitor Device Trend Information		-2000000200 to 2000000200 degrees or units		33-34 (R) (/1000)
Analog Input 2 - Filtered Process Value Display analog input filtered process value.	Monitor Device Trend Information		-2000000200 to 2000000200 degrees or units		45-46 (R) (/1000)
Analog Input 3 - Filtered Process Value Display analog input filtered process value.	Monitor Device Trend Information		-2000000200 to 2000000200 units		(R)
Analog Input 4 - Filtered Process Value Display analog input filtered process value.	Monitor Device Trend Information		-2000000200 to 2000000200 units		(R)
Analog Input 1 - Active Process Value Display analog input process value displayed on web page and used by control loop.	Monitor Device Trend Information		-2000000200 to 2000000200 degrees or units		35-36 (R) (/1000)
Analog Input 2 - Active Process Value Display analog input process value displayed on web page and used by control loop.	Monitor Device Trend Information		-2000000200 to 2000000200 degrees or units		47-48 (R) (/1000)
Analog Input 3 - Active Process Value Display analog input process value displayed on web page and used by control loop.	Monitor Device Trend Information		-2000000200 to 2000000200 units		53-54 (R) (/1000)
Analog Input 4 - Active Process Value Display analog input process value displayed on web page and used by control loop.	Monitor Device Trend Information		--2000000200 to 2000000200 units		57-58 (R) (/1000)

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Analog Input 1 - Error Status Display active errors for analog input.	Monitor Device Trend Information		No Fault (0) Ambient Fault (1) Under Range Fault (2) Over Range Fault (3) Under Flow Fault (4) Over Flow Fault (5) INFOSENSE Fault (6) Lead Compensation Fault (7)	No Fault (0)	37 (R)
Analog Input 2 - Error Status Display active errors for analog input.	Monitor Device Trend Information		No Fault (0) Ambient Fault (1) Under Range Fault (2) Over Range Fault (3) Under Flow Fault (4) Over Flow Fault (5) INFOSENSE Fault (6) Lead Compensation Fault (7)	No Fault (0)	49 (R)
Analog Input 3 - Error Status Display active errors for analog input.	Monitor Device Trend Information		No Fault (0) Under Range Fault (2) Over Range Fault (3) Under Flow Fault (4) Over Flow Fault (5)	No Fault (0)	55 (R)
Analog Input 4 - Error Status Display active errors for analog input.	Monitor Device Trend Information		No Fault (0) Under Range Fault (2) Over Range Fault (3) Under Flow Fault (4) Over Flow Fault (5)	No Fault (0)	59 (R)
Analog Input 1 - Sensor Type Set the analog sensor type.	Device Informatiogura-tion Analog Input 1		None (0) Thermocouple (1) RTD (2) Voltage Process (3) Current Process (4) INFOSENSE PnP (5)	None (0)	251 (R/W)
Analog Input 1 - TC Type Set the thermocouple type.	Configuration Analog Input 1		J (0) K (1) T (2) E (3) N (4) C (5) D (6) PTII (7) R (8) S (9) B (10)	J (0)	252 (R/W)
Analog Input 1 - RTD Curve Set the RTD linearization.	Configuration Analog Input 1		DIN 0.385 (0)	DIN 0.385 (0)	253 (R/W)
Analog Input 1 - Process Precision Set the decimal place for the input value when utilizing process type input that will be displayed in the browser only.	Configuration Analog Input 1		0 (0) 0.0 (1) 0.00 (2) 0.000 (3)	0 (0)	1108 (R)

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Analog Input 1 - Process Units Set the units for process type inputs that will be displayed in the browser only.	Configuration Analog Input 1		Up to four alpha-numeric characters.		1110-1111 (R)
Analog Input 1 - Low Process Scale Set unit value for low process scale. This setting is the displayed process value when the analog input is at minimum.	Configuration Analog Input 1		-30000000 to 30000000 units	-30000000	262-263 (R/W) (/1000)
Analog Input 1 - High Process Scale Set unit value for high process scale. This setting is the displayed process value when the analog input is at maximum.	Configuration Analog Input 1		-30000000 to 30000000 units	30000000	264-265 (R/W) (/1000)
Analog Input 1 - Low Voltage Scale Set unit value for low end of voltage range. This setting determines range of input.	Configuration Analog Input 1		0 to 10000 units	0	258-259 (R/W) (/1000)
Analog Input 1 - High Voltage Scale Set unit value for high end of voltage range. This setting determines range of input.	Configuration Analog Input 1		0 to 10000 units	10000	260-261 (R/W) (/1000)
Analog Input 1 - Low Current Scale Set unit value for low end of current range. This setting determines range of input.	Configuration Analog Input 1		0 to 20000 units	4000	254-255 (R/W) (/1000)
Analog Input 1 - High Current Scale Set unit value for high end of current range. This setting determines range of input.	Configuration Analog Input 1		0 to 20000 units	20000	256-257 (R/W) (/1000)
Analog Input 1 - Temperature Process Value Units Set the temperature units for thermocouple and RTD type inputs that will be displayed in the browser only.	Configuration Analog Input 1		Fahrenheit (0) Celsius (1)	Fahrenheit (0)	1109 (R)
Analog Input 1 - Temperature Process Value Precision Set the decimal place for the input value of temperature when utilizing themocouple or RTD input that will be displayed in the browser only.	Configuration Analog Input 1		0 (0) 0.0 (1)	0 (0)	1107 (R)

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Analog Input 1 - Filter Method Set the filter method. This smoothes out a rapidly changing input signal.	Configuration Analog Input 1		Off (0) First Order (1)	Off (0)	268 (R/W)
Analog Input 1 - Filter Time Base Set the filter time for input in seconds.	Configuration Analog Input 1		100 to 60000 seconds	100	269-270 (R/W) (/1000)
Analog Input 1 - Single Offset Value Set calibration single set point offset value. This allows compensation for lead resistance and sensor error.	Configuration Analog Input 1		-9999000 to 9999000 degrees or units	0	266-267 (R/W) (/1000)
Analog Input 1 - Failure Latching Acknowledge Allows latched inputs errors to be acknowledged and cleared if sensor is repaired.	Monitor Device Trend Information		No (0) Yes (1)	Yes (1)	38 (R/W)

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Analog Input 2 - Sensor Type Set the analog sensor type.	Device Information Configuration Analog Input 2		None (0) Thermocouple (1) RTD (2) Voltage Process (3) Current Process (4) INFOSENSE PnP (5)	None (0)	281 (R/W)
Analog Input 2 - TC Type Set the thermocouple type.	Configuration Analog Input 2		J (0) K (1) T (2) E (3) N (4) C (5) D (6) PTII (7) R (8) S (9) B (10)	J (0)	282 (R/W)
Analog Input 2 - RTD Curve Set the RTD linearization.	Configuration Analog Input 2		DIN 0.385 (0)	DIN 0.385 (0)	283 (R/W)
Analog Input 2 - Process Precision Set the decimal place for the input value when utilizing process type input that will be displayed in the browser only.	Configuration Analog Input 2		0 (0) 0.0 (1) 0.00 (2) 0.000 (3)	0 (0)	1119 (R)
Analog Input 2 - Process Units Set the units for process type inputs that will be displayed in the browser only.	Configuration Analog Input 2		Up to four alpha-numeric characters.		1121-1122 (R)
Analog Input 2 - Low Process Scale Set unit value for low process scale.This setting is the displayed process value when the analog input is at minimum.	Configuration Analog Input 2		-30000000 to 30000000 units	-30000000	292-293 (R/W) (/1000)
Analog Input 2 - High Process Scale Set unit value for high process scale.This setting is the displayed process value when the analog input is at maximum.	Configuration Analog Input 2		-30000000 to 30000000 units	30000000	294-295 (R/W) (/1000)
Analog Input 2 - Low Voltage Scale Set unit value for low end of voltage range. This setting determines range of input.	Configuration Analog Input 2		0 to 10000 units	0	288-289 (R/W) (/1000)
Analog Input 2 - High Voltage Scale Set unit value for high end of voltage range. This setting determines range of input.	Configuration Analog Input 2		0 to 10000 units	10000	290-291 (R/W) (/1000)

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Analog Input 2 - Low Current Scale Set unit value for low end of current range. This setting determines range of input.	Configuration Analog Input 2		0 to 20000 units	4000	284-285 (R/W) (/1000)
Analog Input 2 - High Current Scale Set unit value for high end of current range. This setting determines range of input.	Configuration Analog Input 2		0 to 20000 units	20000	286-287 (R/W) (/1000)
Analog Input 2 - Temperature Process Value Units Set the temperature units for thermocouple and RTD type inputs that will be displayed in the browser only.	Configuration Analog Input 2		Fahrenheit (0) Celsius (1)	Fahrenheit (0)	1120 (R)
Analog Input 2 - Temperature Process Value Precision Set the decimal place for the input value of temperature when utilizing themocouple or RTD input that will be displayed in the browser only.	Configuration Analog Input 2		0 (0) 0.0 (1)	0 (0)	1118 (R)
Analog Input 2 - Filter Method Set the filter method. This smoothes out a rapidly changing input signal.	Configuration Analog Input 2		Off (0) First Order (1)	Off (0)	298 (R/W)
Analog Input 2 - Filter Time Base Set the filter time for input in seconds.	Configuration Analog Input 2		100 to 60000 seconds	100	299-300 (R/W) (/1000)
Analog Input 2 - Single Offset Value Set calibration single set point offset value. This allows compensation for lead resistance and sensor error.	Configuration Analog Input 2		-9999000 to 9999000 degrees or units	0	296-297 (R/W) (/1000)
Loop 2 - Failure Latching Select to latch input failure. If a sensor fails an error is generated. This selection will latch intermittent error.	Configuration Loop Settings 2		Off (0) On (1)	Off (0)	780 (R/W)
Analog Input 2 - Failure Latching Acknowledge Allow latched inputs errors to be acknowleded and cleared if sensor is repaired.	Monitor Device		No (0) Yes (1)	Yes (1)	50 (R/W)
Loop 2 - Failure Fixed Power Select output power level to apply if sensor on input produces errors and transition to manual (open loop) occurs.	Configuration Loop Settings 2		-10000 to 10000 % (two decimal places)	0	781 (R/W) (/100)

Device Configuration > Inputs > CT Inputs 3 and 4

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
CT Input 3 - Sensor Type Set the analog sensor type.	Configuration CT Input 3		None (0) CT Current (6)	None (0)	311 (R/W)
CT Input 3 - CT Precision Set the decimal place for CT Input 3 value that will be displayed in the browser only.	Configuration CT Input 3		0 (0) 0.0 (1) 0.00 (2) 0.000 (3)	0 (0)	1124 (R)
CT Input 3 - CT Units Set the units for CT Input 3 that will be displayed in the browser only.	Configuration CT Input 3		Up to four alpha-numeric characters.		1125-1126 (R)
CT Input 3 - Low CT Scale Set unit value for low CT scale. This setting is the displayed CT value when the analog input is at minimum.	Configuration CT Input 3		-30000000 to 30000000 units	-30000000	316-317 (R/W) (/1000)
CT Input 3 - High CT Scale Set unit value for high CT Input 3 scale. This setting is the displayed CT value when the analog input is at maximum.	Configuration CT Input 3		-30000000 to 30000000 units	30000000	318-319 (R/W) (/1000)
CT Input 3 - Low Current Scale Set unit value for low end of current range. This setting determines range of input.	Configuration CT Input 3		0 to 50000 units	0	312-313 (R/W) (/1000)
CT Input 3 - High Current Scale Set unit value for high end of current range. This setting determines range of input.	Configuration CT Input 3		0 to 50000 units	20000	314-315 (R/W) (/1000)
CT Input 3 - Output Source Select output CT source to monitor. Can't be used to monitor a process output (F).	Configuration CT Input 3		Output 1 (0) Output 2 (1) Output 3 (2) Output 4 (3)	Output 2 (1)	322 (R/W)
CT Input 3 - Single Offset Value Set calibration single set point offset value.This allows compensation for lead resistance and sensor error.	Configuration CT Input 3		-9999000 to 9999000 units	0	320-321 (R/W) (/1000)

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
CT Input 4 - Sensor Type Set the analog sensor type.	Configuration CT Input 4		None (0) CT Current (6)	None (0)	331 (R/W)
CT Input 4 - CT Precision Set the decimal place for the input value when utilizing process type input that will be displayed in the browser only.	Configuration CT Input 4		0 (0) 0.0 (1) 0.00 (2) 0.000 (3)	0 (0)	1128 (R)
CT Input 4 - CT Units Set the units for CT Input 4 that will be displayed in the browser only.	Configuration CT Input 4		Up to four alpha-numeric characters.		1129-1130 (R)
CT Input 4 - Low CT Scale Set unit value for low CT scale.This setting is the displayed CT value when the analog input is at minimum.	Configuration CT Input 4		-30000000 to 30000000 units	-30000000	336-337 (R/W) (/1000)
CT Input 4 - High CT Scale Set unit value for high CT scale. This setting is the displayed CT value when the analog input is at maximum.	Configuration CT Input 4		-30000000 to 30000000 units	30000000	338-339 (R/W) (/1000)
CT Input 4 - Low Current Scale Set unit value for low end of current range. This setting determines range of input.	Configuration CT Input 4		0 to 50000 units	0	332-333 (R/W) (/1000)
CT Input 4 - High Current Scale Set unit value for high end of current range. This setting determines range of input.	Configuration CT Input 4		0 to 50000 units	20000	334-335 (R/W) (/1000)
CT Input 4 - Output Source Select output CT source to monitor.	Configuration CT Input 4		Output 1 (0) Output 2 (1) Output 3 (2) Output 4 (3)	Output 2 (1)	342 (R/W)
CT Input 4 - Single Offset Value Set calibration single set point offset value.This allows compensation for lead resistance and sensor error.	Configuration CT Input 4		-9999000 to 9999000 units	0	340-341 (R/W) (/1000)

Device Configuration > Inputs > Digital Input 3 and 4

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Digital Input 3 - Function Set function for digital input.	Configuration Digital Input 3		Off (0) Acknowledge Alarm (1) Switch To Manual Control (2) Switch Control Loop Off (3) Digital Set Point (4) Pause Data Logging (5)	Off (0)	351 (R/W)
Digital Input 3 - Active State Set level when digital input is active.	Configuration Digital Input 3		False (0) True (1)	False (0)	352 (R/W)
Digital Input 3 - State Display state of digital input.	Configuration Digital Input 3		Inactive (0) Active (1)	Inactive (0)	61 (R)
Digital Input 3 - Acknowledge Alarm Action Specify action when Digital Input 3 is used to acknowledge an alarm.	Configuration Digital Input 3		Silence Alarm (0) Acknowledge Alarm (1) Silence and Acknowledge Alarm (2)	Silence Alarm (0)	368 (R/W)
Digital Input 3 - Select Acknowledge Alarm 1 Select to use Digital Input 3 to acknowledge Alarm 1.	Configuration Digital Input 3		No (0) Yes (1)	No (0)	353 (R/W)
Digital Input 3 - Select Acknowledge Alarm 2 Select to use Digital Input 3 to acknowledge Alarm 2.	Configuration Digital Input 3		No (0) Yes (1)	No (0)	354 (R/W)
Digital Input 3 - Select Acknowledge Alarm 3 Select to use Digital Input 3 to acknowledge Alarm 3.	Configuration Digital Input 3		No (0) Yes (1)	No (0)	355 (R/W)
Digital Input 3 - Select Acknowledge Alarm 4 Select to use Digital Input 3 to acknowledge Alarm 4.	Configuration Digital Input 3		No (0) Yes (1)	No (0)	356 (R/W)
Digital Input 3 - Select Acknowledge Alarm 5 Select to use Digital Input 3 to acknowledge Alarm 5.	Configuration Digital Input 3		No (0) Yes (1)	No (0)	357 (R/W)

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Digital Input 3 - Select Acknowledge Alarm 6 Select to use Digital Input 3 to acknowledge Alarm 6.	Configuration Digital Input 3		No (0) Yes (1)	No (0)	358 (R/W)
Digital Input 3 - Select Acknowledge Alarm 7 Select to use Digital Input 3 to acknowledge Alarm 7.	Configuration Digital Input 3		No (0) Yes (1)	No (0)	359 (R/W)
Digital Input 3 - Select Acknowledge Alarm 8 Select to use Digital Input 3 to acknowledge Alarm 8.	Configuration Digital Input 3		No (0) Yes (1)	No (0)	360 (R/W)
Digital Input 3 - Switch To Manual Loop 1 Select to use Digital Input 3 to switch Loop 1 to manual mode of control.	Configuration Digital Input 3		No (0) Yes (1)	No (0)	361 (R/W)
Digital Input 3 - Switch To Manual Loop 2 Select to use Digital Input 3 to switch Loop 2 to manual mode of control.	Configuration Digital Input 3		No (0) Yes (1)	No (0)	362 (R/W)
Digital Input 3 - Switch Control Loop 1 Off Select to use Digital Input 3 to switch control Loop 1 off.	Configuration Digital Input 3		No (0) Yes (1)	No (0)	363 (R/W)
Digital Input 3 - Switch Control Loop 2 Off Select to use Digital Input 3 to switch control Loop 2 off.	Configuration Digital Input 3		No (0) Yes (1)	No (0)	364 (R/W)
Digital Input 3 - Digital Set Point Specify Digital Set Point value to switch to when Digital Input 3 is activated.	Configuration Digital Input 3			75000	366-367 (R/W) (/1000)

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Digital Input 4 - Function Set function for Digital Input 4.	Configuration Digital Input 4		Off (0) Acknowledge Alarm (1) Switch To Manual Control (2) Switch Control Loop Off (3) Digital Set Point (4) Pause Data Logging (5)	Off (0)	371 (R/W)
Digital Input 4 - Active State Set level when Digital Input 4 is active.	Configuration Digital Input 4		False (0) True (1)	False (0)	372 (R/W)
Digital Input 4 - State Display state of Digital Input 4.	Configuration Digital Input 4		Inactive (0) Active (1)	Inactive (0)	68 (R)
Digital Input 4 - Acknowledge Alarm Action Specify action when Digital Input 4 is used to acknowledge an alarm.	Configuration Digital Input 4		Silence Alarm (0) Acknowledge Alarm (1) Silence and Acknowledge Alarm (2)	Silence Alarm (0)	388 (R/W)
Digital Input 4 - Select Acknowledge Alarm 1 Select to use Digital Input 4 to acknowledge Alarm 1.	Configuration Digital Input 4		No (0) Yes (1)	No (0)	373 (R/W)
Digital Input 4 - Select Acknowledge Alarm 2 Select to use Digital Input 4 to acknowledge Alarm 2.	Configuration Digital Input 4		No (0) Yes (1)	No (0)	374 (R/W)
Digital Input 4 - Select Acknowledge Alarm 3 Select to use Digital Input 4 to acknowledge Alarm 3.	Configuration Digital Input 4		No (0) Yes (1)	No (0)	375 (R/W)
Digital Input 4 - Select Acknowledge Alarm 4 Select to use Digital Input 4 to acknowledge Alarm 4.	Configuration Digital Input 4		No (0) Yes (1)	No (0)	376 (R/W)
Digital Input 4 - Select Acknowledge Alarm 5 Select to use Digital Input 4 to acknowledge Alarm 5.	Configuration Digital Input 4		No (0) Yes (1)	No (0)	377 (R/W)
Digital Input 4 - Select Acknowledge Alarm 6 Select to use Digital Input 4 to acknowledge Alarm 6.	Configuration Digital Input 4		No (0) Yes (1)	No (0)	378 (R/W)

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus (Read/write and scaling)
Digital Input 4 - Select Acknowledge Alarm 7 Select to use Digital Input 4 to acknowledge Alarm 7.	Configuration Digital Input 4		No (0) Yes (1)	No (0)	379 (R/W)
Digital Input 4 - Select Acknowledge Alarm 8 Select to use Digital Input 4 to acknowledge Alarm 8.	Configuration Digital Input 4		No (0) Yes (1)	No (0)	380 (R/W)
Digital Input 4 - Switch To Manual Loop 1 Select to use Digital Input 4 to switch Loop 1 to manual mode of control.	Configuration Digital Input 4		No (0) Yes (1)	No (0)	381 (R/W)
Digital Input 4 - Switch To Manual Loop 2 Select to use Digital Input 4 to switch Loop 2 to manual mode of control.	Configuration Digital Input 4		No (0) Yes (1)	No (0)	382 (R/W)
Digital Input 4 - Switch Control Loop 1 Off Select to use Digital Input 4 to switch control Loop 1 off.	Configuration CT Input 4		No (0) Yes (1)	No (0)	383 (R/W)
Digital Input 4 - Switch Control Loop 2 Off Select to use Digital Input 4 to switch control Loop 2 off.	Configuration Digital Input 4		No (0) Yes (1)	No (0)	384 (R/W)
Digital Input 4 - Digital Set Point Specify Digital Set Point value to switch to when Digital Input 4 is activated.	Configuration Digital Input 4		Within set point limits	75000	386-387 (R/W) (/1000)
Digital Input Switch Control Loop 1 Off Status Indicates that a digital input is forcing Control Loop 1 off.	Monitor Device		Inactive (0) Active (1)	Inactive (0)	63 (R)
Digital Input Switch Control Loop 2 Off Status Indicates that a digital input is forcing Control Loop 2 off.	Monitor Device		Inactive (0) Active (1)	Inactive (0)	70 (R)
Digital Input Switch Control Loop 1 to Manual Control Status Indicates that a digital input is forcing Control Loop 1 to manual mode of operation.	Monitor Device		Inactive (0) Active (1)	Inactive (0)	62 (R)
Digital Input Switch Control Loop 2 To Manual Control Status Indicates that a digital input is forcing Control Loop 2 to manual mode of operation.	Monitor Device		Inactive (0) Active (1)	Inactive (0)	69 (R)

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Control Loop 1 Switch To Digital Input 3 Set Point Status Indicates that Digital Input 3 is forcing Control Loop 1 to use the Digital Set Point.	Monitor Device		Inactive (0) Active (1)	Inactive (0)	64 (R)
Control Loop 2 Switch To Digital Input 3 Set Point Status Indicates that Digital Input 3 is forcing Control Loop 2 to use the Digital Set Point.	Monitor Device		Inactive (0) Active (1)	Inactive (0)	71 (R)
Control Loop 1 Switch To Digital Input 4 Set Point Status Indicates that Digital Input 4 is forcing Control Loop 1 to use the Digital Set Point.	Monitor Device		Inactive (0) Active (1)	Inactive (0)	65 (R)
Control Loop 2 Switch To Digital Input 4 Set Point Status Indicates that Digital Input 4 is forcing Control Loop 2 to use the Digital Set Point.	Monitor Device		Inactive (0) Active (1)	Inactive (0)	72 (R)
Digital Input 3 Set Point Control Loop Select the control loop affected by the Digital Set Point for Digital Input 3	Monitor Device		Loop 1 (0) Loop 2 (1)	Loop 1 (0)	365 (R/W)
Digital Input 4 Set Point Control Loop Select the control loop affected by the Digital Set Point for Digital Input 4	Monitor Device		Loop 1 (0) Loop 2 (1)	Loop 1 (0)	385 (R/W)

Device Configuration > Control Loops > Loop 1

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Loop 1 - Closed Loop Indirect Power Display indirect (heat) power applied based on the PID calculations.	Monitor Device Trend Information		0 to 10000 % (two decimal places)	0	83 (R) (/100)
Loop 1 - Closed Loop Direct Power Display direct (cool) power applied based on the PID calculations.	Monitor Device Trend Information		-10000 to 0 % (two decimal places)	0	84 (R) (/100)
Loop 1 - Working Set Point Active set point. Could be one of several set point sources, Auto Set Point, Digital Set Point or Ramp to Set Point	Monitor Device			75000	78-79 (R) (/1000)
Loop 1 - Auto Set Point Display the closed loop (auto) set point for control loop.	Monitor Device Trend Information		Within set point limits	75000	76-77 (R/W) (/1000)
Loop 1 - Manual/Auto Mode Transitions between open loop (manual) and closed loop (auto) control.	Monitor Device Trend Information		Off (0) Manual (1) Auto (2)	Off (0)	80 (R/W)
Loop 1 - Manual Set Point Display the open loop (manual) set point for control loop.	Monitor Device Trend Information		-10000 to 10000 % (two decimal places)	0	75 (R/W) (/100)
Loop 1 - Loop Action Select the action of the Loop as Indirect (heat only), Direct (cool only) or Dual (heat/cool).	Configuration Loop Settings 1		Off (0) Heat (Indirect) (1) Cool (Direct) (2) Heat/Cool (Indirect/Direct) (3)	Off (0)	653 (R/W)
Loop 1 - Loop Indirect (Heat) Algorithm Select method of control algorithm used for Indirect (Heat) for Loop 1.	Configuration Loop Settings 1		On/Off (0) PID (1)	PID (1)	651 (R/W)
Loop 1 - Loop Direct (Cool) Algorithm Select method of control algorithm used for Direct (Cool) for Loop 1.	Configuration Loop Settings 1		On/Off (0) PID (1)	PID (1)	652 (R/W)
Loop 1 - Failure Latching Select to latch input failure. If a sensor fails, an error is generated. This selection will latch intermittent error.	Configuration Loop Settings 1		Off (0) On (1)	Off (0)	

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Loop 1 - Output Transition from Auto Mode to: Select output action when transitioning from Auto (closed) loop to Manual (open) loop mode.	Configuration Loop Settings 1		Off (0) Fixed Power (1) Bumpless Power (2)	Off (0)	658 (R/W)
Loop 1 - Failure Fixed Power Select output power level to apply if sensor on input produces errors and transition to manual (open loop) occurs.	Configuration Loop Settings 1		-10000 to 10000 % (two decimal places)	0	661 (R/W) (/100)
Loop 1 - Closed Loop Limit Low Set Point Set the minimum Auto (closed loop) set point allowed by operator.	Configuration Loop Settings 1				654-655 (R/W) (/1000)
Loop 1 - Closed Loop Limit High Set Point Set the maximum Auto (closed loop) set point allowed by operator.	Configuration Loop Settings 1				656-657 (R/W) (/1000)
Loop 1 - On/Off Indirect Hysteresis Set the control switching indirect hysteresis for On/Off control. This determines how far into the on region the input needs to move before the output turns on.	Configuration Loop Settings 1		1000 to 99000 degrees or units	3000	662-663 (R/W) (/1000)
Loop 1 - On/Off Direct Hysteresis Set the control switching direct hysteresis for On/Off control. This determines how far into the on region the input needs to move before the output turns on.	Configuration Loop Settings 1		1000 to 99000 degrees or units	3000	664-665 (R/W) (/1000)
Loop 1 - Start Autotune Activates autotuning of PID values.	Configuration Loop Settings 1		No (0) Yes (1)	No (0)	82 (R/W)
Loop 1 - Autotune Set Point Set Autotune set point in %.	Configuration Loop Settings 1		50 to 150 %	90	666 (R/W)
Loop 1 - PID Sets 1 Select to use single or multiple PID Sets for Loop 1.	Configuration Loop Settings 1		Single (0) Multiple (1)	Single (0)	667 (R/W)
Loop 1 - Ramp Action Select the ramp to set point action for Control Loop 1.	Configuration Loop Settings 1		Off (0) Startup (1) SP Change (2) Startup and SP Change (3)	Off (0)	757 (R/W)
Loop 1 - Ramp Rate Enter ramp to set point rate for Control Loop 1.	Configuration Loop Settings 1		0 to 9999000 degrees or units	100000	759-760 (R/W) (/1000)
Loop 1 - Ramp Interval Select the scale of the ramp rate for Control Loop 1.	Configuration Loop Settings 1		Minute (0) Hour (1)	Minute (0)	758 (R/W)

Device Configuration > Control Loops > Loop 1 > PID Set 1

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Loop 1 - PID Crossover Source Specify to switch PID sets based on a set point or a process value.	Configuration Loop Settings 1		Process Value (0) Set Point (1)	Process Value (0)	668 (R/W)
Loop 1 - PID Set 1 Indirect Prop Band Set the heat (indirect) proportional band from set point in process units.	Configuration Loop Settings 1 Configuration Multiple PID Sets 1		1000 to 999000 degrees or units	25000	679-680 (R/W) (/1000)
Loop 1 - PID Set 1 Indirect Integral Set the heat (indirect) integral in minutes per repeat.	Configuration Loop Settings 1 Configuration Multiple PID Sets 1		0 to 99990 minutes	0	681-682 (R/W) (/1000)
Loop 1 - PID Set 1 Indirect Derivative Set the heat (indirect) derivative time in minutes.	Configuration Loop Settings 1 Configuration Multiple PID Sets 1		0 to 9990 minutes	0	683-684 (R/W) (/1000)
Loop 1 - PID Set 1 Indirect Dead Band Set the offset of the heat (indirect) proportional band from set point in process units.	Configuration Loop Settings 1 Configuration Multiple PID Sets 1		0 to 999000 degrees or units	0	677-678 (R/W) (/1000)
Loop 1 - PID Set 1 Direct Prop Band Set the cool (direct) proportional band from set point in process units.	Configuration Loop Settings 1 Configuration Multiple PID Sets 1		1000 to 999000 degrees or units	25000	687-688 (R/W) (/1000)
Loop 1 - PID Set 1 Direct Integral Set the cool (direct) integral in minutes per repeat.	Configuration Loop Settings 1 Configuration Multiple PID Sets 1		0 to 99990 minutes	0	689-690 (R/W) (/1000)
Loop 1 - PID Set 1 Direct Derivative Set the cool (direct) derivative time in minutes.	Configuration Loop Settings 1 Configuration Multiple PID Sets 1		0 to 9990 minutes	0	691-692 (R/W) (/1000)
Loop 1 - PID Set 1 Direct Dead Band Set the offset of the cool (direct) proportional band from set point in process units.	Configuration Loop Settings 1 Configuration Multiple PID Sets 1		0 to 999000 degrees or units	0	685-686 (R/W) (/1000)
Loop 1 - PID Set 1 Crossover Point Set crossover value to switch from PID Set 1 to PID Set 2.	Configuration Loop Settings 1		-30000000 to 30000000 degrees or units	30000000	669-670 (R/W) (/1000)

Device Configuration > Control Loops > Loop 1 > PID Set 2

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Loop 1 - PID Set 2 Indirect Integral Set the heat (indirect) integral in minutes per repeat.	Configuration Multiple PID Sets 1		0 to 99990 minutes	0	697-698 (R/W) (/1000)
Loop 1 - PID Set 2 Indirect Derivative Set the heat (indirect) derivative time in minutes.	Configuration Multiple PID Sets 1		0 to 9990 minutes	0	699-700 (R/W) (/1000)
Loop 1 - PID Set 2 Indirect Dead Band Set the offset of the heat (indirect) proportional band from set point in process units.	Configuration Multiple PID Sets 1		0 to 999000 degrees or units	0	693-694 (R/W) (/1000)
Loop 1 - PID Set 2 Direct Prop Band Set the cool (direct) proportional band from set point in process units.	Configuration Multiple PID Sets 1		1000 to 999000 degrees or units	25000	703-704 (R/W) (/1000)
Loop 1 - PID Set 2 Direct Integral Set the cool (direct) integral in minutes per repeat.	Configuration Multiple PID Sets 1		0 to 99990 minutes	0	705-706 (R/W) (/1000)
Loop 1 - PID Set 2 Direct Derivative Set the cool (direct) derivative time in minutes.	Configuration Multiple PID Sets 1		0 to 9990 minutes	0	707-708 (R/W) (/1000)
Loop 1 - PID Set 2 Direct Dead Band Set the offset of the cool (direct) proportional band from set point in process units.	Configuration Multiple PID Sets 1		0 to 999000 degrees or units	0	701-702 (R/W) (/1000)
Loop 1 - PID Set 2 Crossover Point Set crossover value to switch from PID Set 2 to PID Set 3.	Configuration Loop Settings 1		-30000000 to 30000000 degrees or units	30000000	671-672 (R/W) (/1000)

Device Configuration > Control Loops > Loop 1 > PID Set 3

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Loop 1 - PID Set 3 Indirect Prop Band Set the heat (indirect) proportional band from set point in process units.	Configuration Multiple PID Sets 1		1000 to 999000 degrees or units	25000	711-712 (R/W) (/1000)
Loop 1 - PID Set 3 Indirect Integral Set the heat (indirect) integral in minutes per repeat.	Configuration Multiple PID Sets 1		0 to 99990 minutes	0	713-714 (R/W) (/1000)
Loop 1 - PID Set 3 Indirect Derivative Set the heat (indirect) derivative time in minutes.	Configuration Multiple PID Sets 1		0 to 9990 minutes	0	715-716 (R/W) (/1000)
Loop 1 - PID Set 3 Indirect Dead Band Set the offset of the heat (indirect) proportional band from set point in process units.	Configuration Multiple PID Sets 1		0 to 999000 degrees or units	0	709-710 (R/W) (/1000)
Loop 1 - PID Set 3 Direct Prop Band Set the cool (direct) proportional band from set point in process units.	Configuration Multiple PID Sets 1		1000 to 999000 degrees or units	25000	719-720 (R/W) (/1000)
Loop 1 - PID Set 3 Direct Integral Set the cool (direct) integral in minutes per repeat.	Configuration Multiple PID Sets 1		0 to 99990 minutes	0	721-722 (R/W) (/1000)
Loop 1 - PID Set 3 Direct Derivative Set the cool (direct) derivative time in minutes.	Configuration Multiple PID Sets 1		0 to 9990 minutes	0	723-724 (R/W) (/1000)
Loop 1 - PID Set 3 Direct Dead Band Set the offset of the cool (direct) proportional band from set point in process units.	Configuration Multiple PID Sets 1		0 to 999000 degrees or units	0	717-718 (R/W) (/1000)
Loop 1 - PID Set 3 Crossover Point Set crossover value to switch from PID Set 3 to PID Set 4.	Configuration Loop Settings 1		-30000000 to 30000000 degrees or units	30000000	673-674 (R/W) (/1000)

Device Configuration > Control Loops > Loop 1 > PID Set 4

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Loop 1 - PID Set 4 Indirect Prop Band Set the heat (indirect) proportional band from set point in process units.	Configuration Multiple PID Sets 1		1000 to 999000 degrees or units	25000	727-728 (R/W) (/1000)
Loop 1 - PID Set 4 Indirect Integral Set the heat (indirect) integral in minutes per repeat.	Configuration Multiple PID Sets 1		0 to 99990 minutes	0	729-730 (R/W) (/1000)
Loop 1 - PID Set 4 Indirect Derivative Set the heat (indirect) derivative time in minutes.	Configuration Multiple PID Sets 1		0 to 9990 minutes	0	731-732 (R/W) (/1000)
Loop 1 - PID Set 4 Indirect Dead Band Set the offset of the heat (indirect) proportional band from set point in process units.	Configuration Multiple PID Sets 1		0 to 999000 degrees or units	0	725-726 (R/W) (/1000)
Loop 1 - PID Set 4 Direct Prop Band Set the cool (direct) proportional band from set point in process units.	Configuration Multiple PID Sets 1		1000 to 999000 degrees or units	25000	735-736 (R/W) (/1000)
Loop 1 - PID Set 4 Direct Integral Set the cool (direct) integral in minutes per repeat.	Configuration Multiple PID Sets 1		0 to 99990 minutes	0	737-738 (R/W) (/1000)
Loop 1 - PID Set 4 Direct Derivative Set the cool (direct) derivative time in minutes.	Configuration Multiple PID Sets 1		0 to 9990 minutes	0	739-740 (R/W) (/1000)
Loop 1 - PID Set 4 Direct Dead Band Set the offset of the cool (direct) proportional band from set point in process units.	Configuration Multiple PID Sets 1		0 to 999000 degrees or units	0	733-734 (R/W) (/1000)
Loop 1 - PID Set 4 Crossover Point Set crossover value to switch from PID Set 4 to PID Set 5.	Configuration Loop Settings 1		-30000000 to 30000000 degrees or units	30000000	675-676 (R/W) (/1000)

Device Configuration > Control Loops > Loop 1 > PID Set 5

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Loop 1 - PID Set 5 Indirect Prop Band Set the heat (indirect) proportional band from set point in process units.	Configuration Multiple PID Sets 1		1000 to 999000 degrees or units	25000	743-744 (R/W) (/1000)
Loop 1 - PID Set 5 Indirect Integral Set the heat (indirect) integral in minutes per repeat.	Configuration Multiple PID Sets 1		0 to 99990 minutes	0	745-746 (R/W) (/1000)
Loop 1 - PID Set 5 Indirect Derivative Set the heat (indirect) derivative time in minutes.	Configuration Multiple PID Sets 1		0 to 9990 minutes	0	747-748 (R/W) (/1000)
Loop 1 - PID Set 5 Indirect Dead Band Set the offset of the heat (indirect) proportional band from set point in process units.	Configuration Multiple PID Sets 1		0 to 999000 degrees or units	0	741-742 (R/W) (/1000)
Loop 1 - PID Set 5 Direct Prop Band Set the cool (direct) proportional band from set point in process units.	Configuration Multiple PID Sets 1		1000 to 999000 degrees or units	25000	751-752 (R/W) (/1000)
Loop 1 - PID Set 5 Direct Integral Set the cool (direct) integral in minutes per repeat.	Configuration Multiple PID Sets 1		0 to 99990 minutes	0	753-754 (R/W) (/1000)
Loop 1 - PID Set 5 Direct Derivative Set the cool (direct) derivative time in minutes.	Configuration Multiple PID Sets 1		0 to 9990 minutes	0	755-756 (R/W) (/1000)
Loop 1 - PID Set 5 Direct Dead Band Set the offset of the cool (direct) proportional band from set point in process units.	Configuration Multiple PID Sets 1		0 to 999000 degrees or units	0	749-750 (R/W) (/1000)

Device Configuration > Control Loops > Loop 2

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Loop 2 - Closed Indirect Power Display Indirect (Heat) power output for Loop 2.	Monitor Device Trend Information		0 to 10000 % (two decimal places)	0	97 (R) (/100)
Loop 2 - Closed Direct Power Display Direct (Cool) power output for Loop 2.	Monitor Device Trend Information		-10000 to 0 % (two decimal places)	0	98 (R) (/100)
Loop 2 - Working Set Point Active set point. Could be one of several set point sources, Auto Set Point, Digital Set Point or Ramp to Set Point	Monitor Device			75000	92-93 (R) (/1000)
Loop 2 - Auto Set Point Display the closed loop (auto) set point for Control Loop 2.	Monitor Device Trend Information			75000	90-91 (R/W) (/1000)
Loop 2 - Manual/Auto Mode Transitions between open loop (manual) and closed loop (auto) control.	Monitor Device Trend Information		Off (0) Manual (1) Auto (2)	Off (0)	94 (R/W)
Loop 2 - Manual Set Point Display the open loop (manual) set point for control loop.	Monitor Device Trend Information		-10000 to 10000 % (two decimal places)	0	89 (R/W) (/100)
Loop 2 - Loop Action Select the action of the Loop as Indirect (heat only), Direct (cool only) or Dual (heat/cool)	Configuration Loop Settings 2		Off (0) Heat (Indirect) (1) Cool (Direct) (2) Heat/Cool (Indirect/Direct) (3)	Off (0)	773 (R/W)
Loop 2 - Loop Indirect (Heat) Algorithm Select method of control algorithm used for Indirect (Heat) for Loop 2.	Configuration Loop Settings 2		On/Off (0) PID (1)	PID (1)	771 (R/W)
Loop 2 - Loop Direct (Cool) Algorithm Select method of control algorithm used for Direct (Cool) for Loop 2	Configuration Loop Settings 2		On/Off (0) PID (1)	PID (1)	772 (R/W)

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Loop 2 - Transition from Auto Mode to: Select outputs action when transitioning from Auto (closed) loop to Manual (open) loop mode.	Configuration Loop Settings 2		Off (0) Fixed Power (1) Bumpless Power (2)	Off (0)	778 (R/W)
Loop 2 - Closed Loop Limit Low Set Point Set the minimum Auto (closed loop) set point allowed by operator.	Configuration Loop Settings 2				774-775 (R/W) (/1000)
Loop 2 - Closed Loop Limit High Set Point Set the maximum Auto (closed loop) set point allowed by operator.	Configuration Loop Settings 2				776-777 (R/W) (/1000)
Loop 2 - On/Off Indirect Hysteresis Set the control switching indirect hysteresis for On/Off control. This determines how far into the on region the input needs to move before the output turns on.	Configuration Loop Settings 2		1000 to 99000 degrees or units	3000	782-783 (R/W) (/1000)
Loop 2 - On/Off Direct Hysteresis Set the control switching direct hysteresis for On/Off control. This determines how far into the on region the input needs to move before the output turns on.	Configuration Loop Settings 2		1000 to 99000 degrees or units	3000	784-785 (R/W) (/1000)
Loop 2 - Start Autotune Activates autotuning of PID values.	Configuration Loop Settings 2		No (0) Yes (1)	No (0)	96 (R/W)
Loop 2 - Autotune Set Point Set Autotune set point in %.	Configuration Loop Settings 2		50 to 150 %	90	786 (R/W)
Loop 2 - PID Sets 2 Select to use single or multiple PID Sets for Loop 2.	Configuration Loop Settings 2		Single (0) Multiple (1)	Single (0)	787 (R/W)
Loop 2 - Ramp Action Select the ramp to set point action for Control Loop 2.	Configuration Loop Settings 2		Off (0) Startup (1) SP Change (2) Startup and SP Change (3)	Off (0)	877 (R/W)
Loop 2 - Ramp Rate Enter ramp to set point rate for Control Loop 2.	Configuration Loop Settings 2		0 to 9999000 degrees or units	100000	879-880 (R/W) (/1000)
Loop 2 - Ramp Interval Select the scale of the ramp rate for Control Loop 2.	Configuration Loop Settings 2		Minute (0) Hour (1)	Minute (0)	878 (R/W)

Device Configuration > Control Loops > Loop 2 > PID Set 1

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Loop 2 - PID Crossover Source Specify to switch PID sets based on a set point or a process value.	Configuration Loop Settings 2		Process Value (0) Set Point (1)	Process Value (0)	788 (R/W)
Loop 2 - PID Set 1 Indirect Prop Band Set the heat (indirect) proportional band from set point in process units.	Configuration Loop Settings 2 Configuration Multiple PID Sets 2		1000 to 999000 degrees or units	25000	799-800 (R/W) (/1000)
Loop 2 - PID Set 1 Indirect Integral Set the heat (indirect) integral in minutes per repeat.	Configuration Loop Settings 2 Configuration Multiple PID Sets 2		0 to 99990 minutes	0	801-802 (R/W) (/1000)
Loop 2 - PID Set 1 Indirect Derivative Set the heat (indirect) derivative time in minutes.	Configuration Loop Settings 2 Configuration Multiple PID Sets 2		0 to 9990 minutes	0	803-804 (R/W) (/1000)
Loop 2 - PID Set 1 Indirect Dead Band Set the offset of the heat (indirect) proportional band from set point in process units.	Configuration Loop Settings 2 Configuration Multiple PID Sets 2		0 to 999000 degrees or units	0	797-798 (R/W) (/1000)
Loop 2 - PID Set 1 Direct Prop Band Set the cool (direct) proportional band from set point in process units.	Configuration Loop Settings 2 Configuration Multiple PID Sets 2		1000 to 999000 degrees or units	25000	807-808 (R/W) (/1000)
Loop 2 - PID Set 1 Direct Integral Set the cool (direct) integral in minutes per repeat.	Configuration Loop Settings 2 Configuration Multiple PID Sets 2		0 to 99990 minutes	0	809-810 (R/W) (/1000)
Loop 2 - PID Set 1 Direct Derivative Set the cool (direct) derivative time in minutes.	Configuration Loop Settings 2 Configuration Multiple PID Sets 2		0 to 9990 minutes	0	811-812 (R/W) (/1000)
Loop 2 - PID Set 1 Direct Dead Band Set the offset of the cool (direct) proportional band from set point in process units.	Configuration Loop Settings 2 Configuration Multiple PID Sets 2		0 to 999000 degrees or units	0	805-806 (R/W) (/1000)
Loop 2 - PID Set 1 Crossover Point Set crossover value to switch from PID Set 1 to PID Set 2.	Configuration Loop Settings 2		-30000000 to 30000000 degrees or units	30000000	789-790 (R/W) (/1000)

Device Configuration > Control Loops > Loop 2 > PID Set 2

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Loop 2 - PID Set 2 Indirect Prop Band Set the heat (indirect) proportional band from set point in process units.	Configuration Multiple PID Sets 2		1000 to 999000 degrees or units	25000	815-816 (R/W) (/1000)
Loop 2 - PID Set 2 Indirect Integral Set the heat (indirect) integral in minutes per repeat.	Configuration Multiple PID Sets 2		0 to 99990 minutes	0	817-818 (R/W) (/1000)
Loop 2 - PID Set 2 Indirect Derivative Set the heat (indirect) derivative time in minutes.	Configuration Multiple PID Sets 2		0 to 9990 minutes	0	819-820 (R/W) (/1000)
Loop 2 - PID Set 2 Indirect Dead Band Set the offset of the heat (indirect) proportional band from set point in process units.	Configuration Multiple PID Sets 2		0 to 999000 degrees or units	0	813-814 (R/W) (/1000)
Loop 2 - PID Set 2 Direct Prop Band Set the cool (direct) proportional band from set point in process units.	Configuration Multiple PID Sets 2		1000 to 999000 degrees or units	25000	823-824 (R/W) (/1000)
Loop 2 - PID Set 2 Direct Integral Set the cool (direct) integral in minutes per repeat.	Configuration Multiple PID Sets 2		0 to 99990 minutes	0	825-826 (R/W) (/1000)
Loop 2 - PID Set 2 Direct Derivative Set the cool (direct) derivative time in minutes.	Configuration Multiple PID Sets 2		0 to 9990 minutes	0	827-828 (R/W) (/1000)
Loop 2 - PID Set 2 Direct Dead Band Set the offset of the cool (direct) proportional band from set point in process units.	Configuration Multiple PID Sets 2		0 to 999000 degrees or units	0	821-822 (R/W) (/1000)
Loop 2 - PID Set 2 Crossover Point Set crossover value to switch from PID Set 2 to PID Set 3.	Configuration Loop Settings 2		-30000000 to 30000000 degrees or units	30000000	791-792 (R/W) (/1000)

Device Configuration > Control Loops > Loop 2 > PID Set 3

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Loop 2 - PID Set 3 Indirect Prop Band Set the heat (indirect) proportional band from set point in process units.	Configuration Multiple PID Sets 2		1000 to 999000 degrees or units	25000	831-832 (R/W) (/1000)
Loop 2 - PID Set 3 Indirect Integral Set the heat (indirect) integral in minutes per repeat.	Configuration Multiple PID Sets 2		0 to 99990 minutes	0	833-834 (R/W) (/1000)
Loop 2 - PID Set 3 Indirect Derivative Set the heat (indirect) derivative time in minutes.	Configuration Multiple PID Sets 2		0 to 9990 minutes	0	835-836 (R/W) (/1000)
Loop 2 - PID Set 3 Indirect Dead Band Set the offset of the heat (indirect) proportional band from set point in process units.	Configuration Multiple PID Sets 2		0 to 999000 degrees or units	0	829-830 (R/W) (/1000)
Loop 2 - PID Set 3 Direct Prop Band Set the cool (direct) proportional band from set point in process units.	Configuration Multiple PID Sets 2		1000 to 999000 degrees or units	25000	839-840 (R/W) (/1000)
Loop 2 - PID Set 3 Direct Integral Set the cool (direct) integral in minutes per repeat.	Configuration Multiple PID Sets 2		0 to 99990 minutes	0	841-842 (R/W) (/1000)
Loop 2 - PID Set 3 Direct Derivative Set the cool (direct) derivative time in minutes.	Configuration Multiple PID Sets 2		0 to 9990 minutes	0	843-844 (R/W) (/1000)
Loop 2 - PID Set 3 Direct Dead Band Set the offset of the cool (direct) proportional band from set point in process units.	Configuration Multiple PID Sets 2		0 to 999000 degrees or units	0	837-838 (R/W) (/1000)
Loop 2 - PID Set 3 Crossover Point Set crossover value to switch from PID Set 3 to PID Set 4.	Configuration Loop Settings 2		-30000000 to 30000000 degrees or units	30000000	793-794 (R/W) (/1000)

Device Configuration > Control Loops > Loop 2 > PID Set 4

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Loop 2 - PID Set 4 Indirect Prop Band Set the heat (indirect) proportional band from set point in process units.	Configuration Multiple PID Sets 2		1000 to 999000 degrees or units	25000	847-848 (R/W) (/1000)
Loop 2 - PID Set 4 Indirect Integral Set the heat (indirect) integral in minutes per repeat.	Configuration Multiple PID Sets 2		0 to 99990 minutes	0	849-850 (R/W) (/1000)
Loop 2 - PID Set 4 Indirect Derivative Set the heat (indirect) derivative time in minutes.	Configuration Multiple PID Sets 2		0 to 9990 minutes	0	851-852 (R/W) (/1000)
Loop 2 - PID Set 4 Indirect Dead Band Set the offset of the heat (indirect) proportional band from set point in process units.	Configuration Multiple PID Sets 2		0 to 999000 degrees or units	0	845-846 (R/W) (/1000)
Loop 2 - PID Set 4 Direct Prop Band Set the cool (direct) proportional band from set point in process units.	Configuration Multiple PID Sets 2		1000 to 999000 degrees or units	25000	855-856 (R/W) (/1000)
Loop 2 - PID Set 4 Direct Integral Set the cool (direct) integral in minutes per repeat.	Configuration Multiple PID Sets 2		0 to 99990 minutes	0	857-858 (R/W) (/1000)
Loop 2 - PID Set 4 Direct Derivative Set the cool (direct) derivative time in minutes.	Configuration Multiple PID Sets 2		0 to 9990 minutes	0	859-860 (R/W) (/1000)
Loop 2 - PID Set 4 Direct Dead Band Set the offset of the cool (direct) proportional band from set point in process units.	Configuration Multiple PID Sets 2		0 to 999000 degrees or units	0	853-854 (R/W) (/1000)
Loop 2 - PID Set 4 Crossover Point Set crossover value to switch from PID Set 4 to PID Set 5.	Configuration Loop Settings 2		-30000000 to 30000000 degrees or units	30000000	795-796 (R/W) (/1000)

Device Configuration > Control Loops > Loop 2 > PID Set 5

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Loop 2 - PID Set 5 Indirect Prop Band Set the heat (indirect) proportional band from set point in process units.	Configuration Multiple PID Sets 2		1000 to 999000 degrees or units	25000	863-864 (R/W) (/1000)
Loop 2 - PID Set 5 Indirect Integral Set the heat (indirect) integral in minutes per repeat.	Configuration Multiple PID Sets 2		0 to 99990 minutes	0	865-866 (R/W) (/1000)
Loop 2 - PID Set 5 Indirect Derivative Set the heat (indirect) derivative time in minutes.	Configuration Multiple PID Sets 2		0 to 9990 minutes	0	867-868 (R/W) (/1000)
Loop 2 - PID Set 5 Indirect Dead Band Set the offset of the heat (indirect) proportional band from set point in process units.	Configuration Multiple PID Sets 2		0 to 999000 degrees or units	0	861-862 (R/W) (/1000)
Loop 2 - PID Set 5 Direct Prop Band Set the cool (direct) proportional band from set point in process units.	Configuration Multiple PID Sets 2		1000 to 999000 degrees or units	25000	871-872 (R/W) (/1000)
Loop 2 - PID Set 5 Direct Integral Set the cool (direct) integral in minutes per repeat.	Configuration Multiple PID Sets 2		0 to 99990 minutes	0	873-874 (R/W) (/1000)
Loop 2 - PID Set 5 Direct Derivative Set the cool (direct) derivative time in minutes.	Configuration Multiple PID Sets 2		0 to 9990 minutes	0	875-876 (R/W) (/1000)
Loop 2 - PID Set 5 Direct Dead Band Set the offset of the cool (direct) proportional band from set point in process units.	Configuration Multiple PID Sets 2		0 to 999000 degrees or units	0	869-870 (R/W) (/1000)

Device Configuration > Outputs > Output 1

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Output - System Power Line Frequency Select the frequency of the line voltage.	Configuration Outputs		50 Hz. (0) 60 Hz. (1)	60 Hz. (1)	1075 (R/W)
Output 1 - Function Select the function of the output.	Configuration Output 1		Off (0) Control (1) Event (2) Retransmit (3)	Off (0)	391 (R/W)
Output 1 - Output Direction Select whether the output will be for heating (reverse action) or cooling (direct action).	Configuration Output 1		Off (0) Heat (Indirect) (1) Cool (Direct) (2)	Off (0)	398 (R/W)
Output 1 - Control Source Set Loop which will control this output.	Configuration Output 1		Loop 1 (0) Loop 2 (1)	Loop 1 (0)	393 (R/W)
Output 1 - Output Cycle Time Set the cycle time in seconds.	Configuration Output 1		0.1 to 60 seconds for non-mechanical relay outputs 1.0 to 60 seconds for mechanical relay outputs	1.0 second for non-mech relay output 10.0 seconds for mechanical relay output	392 (R/W) (/10)
Output 1 - Output Mode Time Base Select method of output control as either Fixed Time Base or Variable Time Base.	Configuration Output 1		Fixed (0) Variable (1)	Fixed (0)	396 (R/W)
Output 1 - Low Power Scale Set unit value for low power scale. This setting is the process power value when the analog output is at minimum.	Configuration Output 1		0 to 10000 % (two decimal places)	0	418-419 (R/W) (/100)
Output 1 - High Power Scale Set unit value for high power scale. This setting is the process power value when the analog output is at maximum.	Configuration Output 1		0 to 10000 % (two decimal places)	10000	420-421 (R/W) (/100)
Output 1 - Logic Operator Select logic operation for event output.	Configuration Output 1		AND (0) OR (1)	AND (0)	399 (R/W)

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Output 1 - Output Source Alarm 1 Set to enable Alarm 1 source.	Configuration Output 1		No (0) Yes (1)	No (0)	400 (R/W)
Output 1 - Output Source Alarm 2 Set to enable Alarm 2 source.	Configuration Output 1		No (0) Yes (1)	No (0)	401 (R/W)
Output 1 - Output Source Alarm 3 Set to enable Alarm 3 source.	Configuration Output 1		No (0) Yes (1)	No (0)	402 (R/W)
Output 1 - Output Source Alarm 4 Set to enable Alarm 4 source.	Configuration Output 1		No (0) Yes (1)	No (0)	403 (R/W)
Output 1 - Output Source Alarm 5 Set to enable Alarm 5 source.	Configuration Output 1		No (0) Yes (1)	No (0)	404 (R/W)
Output 1 - Output Source Alarm 6 Set to enable Alarm 6 source.	Configuration Output 1		No (0) Yes (1)	No (0)	405 (R/W)
Output 1 - Output Source Alarm 7 Set to enable Alarm 7 source.	Configuration Output 1		No (0) Yes (1)	No (0)	406 (R/W)
Output 1 - Output Source Alarm 8 Set to enable Alarm 8 source.	Configuration Output 1		No (0) Yes (1)	No (0)	407 (R/W)
Output 1 - Output Source Digital 3 Set to enable Digital Input 3 source.	Configuration Output 1		No (0) Yes (1)	No (0)	429 (R/W)
Output 1 - Output Source Digital 4 Set to enable Digital Input 4 source.	Configuration Output 1		No (0) Yes (1)	No (0)	430 (R/W)
Output 1 - Output Logic Select output state in an alarm true condition.	Configuration Output 1		Energized (0) De-energized (1)	Energized (0)	408 (R/W)

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Output 1 - Analog Type Select analog output type.	Configuration Output 1		Voltage (0) Current (1)	Voltage (0)	409 (R/W)
Output 1 - Current Low Scale Set unit value for low end of current range. This setting determines range of output.	Configuration Output 1		0 to 20000 units	4000	410-411 (R/W) (/1000)
Output 1 - Current High Scale Set unit value for high end of current range. This setting determines range of output.	Configuration Output 1		0 to 20000 units	20000	412-413 (R/W) (/1000)
Output 1 - Voltage Low Scale Set unit value for low end of voltage range. This setting determines range of output.	Configuration Output 1		0 to 10000 units	0	414-415 (R/W) (/1000)
Output 1 - Voltage High Scale Set unit value for high end of voltage range. This setting determines range of output.	Configuration Output 1		0 to 10000 units	10000	416-417 (R/W) (/1000)
Output 1 - Retransmit Source Select which source Output 1 will retransmit.	Configuration Output 1		Process Value 1 (0) Process Value 2 (2) Set Point 1 (1) Set Point 2 (3)	Process Value 1 (0)	422 (R/W)
Output 1 - Retransmit Low Scale Set low end of the current or voltage range for the retransmit signal.	Configuration Output 1		-2000000200 to 2000000200 degrees or units	-2000000200	423-424 (R/W) (/1000)
Output 1 - Retransmit High Scale Set high end of the current or voltage range for the retransmit signal.	Configuration Output 1		-2000000200 to 2000000200 degrees or units	2000000200	425-426 (R/W) (/1000)
Output 1 - Retransmit Offset Set the offset value for the retransmit signal.	Configuration Output 1		-9999000 to 9999000 degrees or units	0	427-428 (R/W) (/1000)
Output 1 - State Display state of output.	Monitor Device		Inactive (0) Active (1)	Inactive (0)	397 (R)

Device Configuration > Outputs > Output 2

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Output 2 - Function Select the function of the output.	Configuration Output 2		Off (0) Control (1) Event (2)	Off (0)	431 (R/W)
Output 2 - Output Direction Select whether the output will be for heating (reverse action) or cooling (direct action).	Configuration Output 2		Off (0) Heat (Indirect) (1) Cool (Direct) (2)	Off (0)	438 (R/W)
Output 2 - Control Source Set Loop which will control this output.	Configuration Output 2		Loop 1 (0) Loop 2 (1)	Loop 1 (0)	433 (R/W)
Output 2 - Output Cycle Time Set the cycle time in seconds.	Configuration Output 2		0.1 to 60 seconds for non-mechanical relay outputs 1.0 to 60 seconds for mechanical relay outputs	1.0 second for non-mech relay output 10.0 seconds for mechanical relay output	432 (R/W) (/10)
Output 2 - Output Mode Time Base Select method of output control as either Fixed Time Base or Variable Time Base.	Configuration Output 2		Fixed (0) Variable (1)	Fixed (0)	436 (R/W)
Output 2 - Low Power Scale Set unit value for low power scale. This setting is the process power value when the analog output is at minimum.	Configuration Output 2		0 to 10000 % (two decimal places)	0	449-450 (R/W) (/100)
Output 2 - High Power Scale Set unit value for high power scale. This setting is the process power value when the analog output is at maximum.	Configuration Output 2		0 to 10000 % (two decimal places)	10000	451-452 (R/W) (/100)
Output 2 - Logic Operator Select logic operation for event output.	Configuration Output 2		AND (0) OR (1)	AND (0)	439 (R/W)
Output 2 - Output Source Alarm 1 Set to enable Alarm 1 source.	Configuration Output 2		No (0) Yes (1)	No (0)	440 (R/W)
Output 2 - Output Source Alarm 2 Set to enable Alarm 2 source.	Configuration Output 2		No (0) Yes (1)	No (0)	441 (R/W)
Output 2 - Output Source Alarm 3 Set to enable Alarm 3 source.	Configuration Output 2		No (0) Yes (1)	No (0)	442 (R/W)

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Output 2 - Output Source Alarm 4 Set to enable Alarm 4 source.	Configuration Output 2		No (0) Yes (1)	No (0)	443 (R/W)
Output 2 - Output Source Alarm 5 Set to enable Alarm 5 source.	Configuration Output 2		No (0) Yes (1)	No (0)	444 (R/W)
Output 2 - Output Source Alarm 6 Set to enable Alarm 6 source.	Configuration Output 2		No (0) Yes (1)	No (0)	445 (R/W)
Output 2 - Output Source Alarm 7 Set to enable Alarm 7 source.	Configuration Output 2		No (0) Yes (1)	No (0)	446 (R/W)
Output 2 - Output Source Alarm 8 Set to enable Alarm 8 source.	Configuration Output 2		No (0) Yes (1)	No (0)	447 (R/W)
Output 2 -Output Source Digital 3 Set to enable Digital Input 3 source.	Configuration Output 2		No (0) Yes (1)	No (0)	453 (R/W)
Output 2 -Output Source Digital 4 Set to enable Digital Input 4 source.	Configuration Output 2		No (0) Yes (1)	No (0)	454 (R/W)
Output 2 - Output Logic Select output state in an alarm true condition.	Configuration Output 2		Energized (0) De-energized (1)	Energized (0)	448 (R/W)
Output 2 - State Display state of output.	Monitor Device		Inactive (0) Active (1)	Inactive (0)	437 (R)

Device Configuration > Outputs > Output 3

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Output 3 - Function Select the function of the output.	Configuration Output 3		Off (0) Control (1) Event (2) Retransmit (3)	Off (0)	461 (R/W)
Output 3 - Output Cycle Time Set the cycle time in seconds.	Configuration Output 3		0.1 to 60 seconds for non-mechanical relay outputs 1.0 to 60 seconds for mechanical relay outputs	1.0 second for non-mech relay output 10.0 seconds for mechanical relay output	462 (R/W) (/10)
Output 3 - Control Source Set Loop which will control this output.	Configuration Output 3		Loop 1 (0) Loop 2 (1)	Loop 1 (0)	463 (R/W)
Output 3 - Output Mode Time Base Select method of output control as either Fixed Time Base or Variable Time Base.	Configuration Output 3		Fixed (0) Variable (1)	Fixed (0)	466 (R/W)
Output 3 - Low Power Scale Set unit value for low power scale. This setting is the process power value when the analog output is at minimum.	Configuration Output 3		0 to 10000 % (two decimal places)	10000	488-489 (R/W) (/100)
Output 3 - High Power Scale Set unit value for high power scale. This setting is the process power value when the analog output is at maximum.	Configuration Output 3		0 to 10000 % (two decimal places)	10000	490-491 (R/W) (/100)
Output 3 - Output Direction Select whether the output will be for heating (reverse action) or cooling (direct action).	Configuration Output 3		Off (0) Heat (Indirect) (1) Cool (Direct) (2)	Off (0)	468 (R/W)
Output 3 - Logic Operator Select logic operation for event output.	Configuration Output 3		AND (0) OR (1)	And (0)	469 (R/W)
Output 3 - Output Source Alarm 1 Set to enable Alarm 1 source.	Configuration Output 3		No (0) Yes (1)	No (0)	470 (R/W)
Output 3 - Output Source Alarm 2 Set to enable Alarm 2 source.	Configuration Output 3		No (0) Yes (1)	No (0)	471 (R/W)
Output 3 - Output Source Alarm 3 Set to enable Alarm 3 source.	Configuration Output 3		No (0) Yes (1)	No (0)	472 (R/W)

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Output 3 - Output Source Alarm 4 Set to enable Alarm 4 source.	Configuration Output 3		No (0) Yes (1)	No (0)	473 (R/W)
Output 3 - Output Source Alarm 5 Set to enable Alarm 5 source.	Configuration Output 3		No (0) Yes (1)	No (0)	474 (R/W)
Output 3 - Output Source Alarm 6 Set to enable Alarm 6 source.	Configuration Output 3		No (0) Yes (1)	No (0)	475 (R/W)
Output 3 - Output Source Alarm 7 Set to enable Alarm 7 source.	Configuration Output 3		No (0) Yes (1)	No (0)	476 (R/W)
Output 3 - Output Source Alarm 8 Set to enable Alarm 8 source.	Configuration Output 3		No (0) Yes (1)	No (0)	477 (R/W)
Output 3 - Output Source Digital 3 Set to enable Digital Input 3 source.	Configuration Output 3		No (0) Yes (1)	No (0)	499 (R/W)
Output 3 - Output Source Digital 4 Set to enable Digital Input 4 source.	Configuration Output 3		No (0) Yes (1)	No (0)	500 (R/W)
Output 3 - Output Logic Select output state in an alarm true condition.	Configuration Output 3		Energized (0) De-energized (1)	Energized (0)	478 (R/W)
Output 3 - Analog Type Select analog output type.	Configuration Output 3		Voltage (0) Current (1)	Voltage (0)	479 (R/W)
Output 3 - Current Low Scale Set unit value for low end of current range. This setting determines range of output.	Configuration Output 3		0 to 20000 units	4000	480-481 (R/W) (/1000)
Output 3 - Current High Scale Set unit value for high end of current range. This setting determines range of output.	Configuration Output 3		0 to 20000 units	20000	482-483 (R/W) (/1000)

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Output 3 - Voltage Low Scale Set unit value for low end of voltage range. This setting determines range of output.	Configuration Output 3		0 to 10000 units	0	484-485 (R/W) (/1000)
Output 3 - Voltage High Scale Set unit value for high end of voltage range. This setting determines range of output.	Configuration Output 3		0 to 10000 units	10000	486-487 (R/W) (/1000)
Output 3 - Retransmit Source Select which source Output 3 will retransmit.	Configuration Output 3		Process Value 1 (0) Process Value 2 (2) Set Point 1 (1) Set Point 2 (3)	Process Value 1 (0)	492 (R/W)
Output 3 - Retransmit Low Scale Set low end of the current or voltage range for the retransmit signal.	Configuration Output 3		-2000000200 to 2000000200 degrees or units	-2000000200	493-494 (R/W) (/1000)
Output 3 - Retransmit High Scale Set high end of the current or voltage range for the retransmit signal.	Configuration Output 3		-2000000200 to 2000000200 degrees or units	2000000200	495-496 (R/W) (/1000)
Output 3 - Retransmit Offset Set the offset value for the retransmit signal.	Configuration Output 3		-9999000 to 9999000 degrees or units	0	497-498 (R/W) (/1000)
Output 3 - State Display state of output.	Monitor Device		Inactive (0) Active (1)	Inactive (0)	467 (R)

Device Configuration > Outputs > Output 4

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Output 4 - Function Select the function of the output.	Configuration Output 4		Off (0) Control (1) Event (2)	Off (0)	501 (R/W)
Output 4 - Output Cycle Time Set the cycle time in seconds.	Configuration Output 4		0.1 to 60 seconds for non-mechanical relay outputs 1.0 to 60 seconds for mechanical relay outputs	1.0 second for non-mech relay output 10.0 seconds for mechanical relay output	502 (R/W) (/10)
Output 4 - Control Source Set Loop which will control this output.	Configuration Output 4		Loop 1 (0) Loop 2 (1)	Loop 1 (0)	503 (R/W)
Output 4 - Output Mode Time Base Select method of output control as either Fixed Time Base or Variable Time Base.	Configuration Output 4		Fixed (0) Variable (1)	Fixed (0)	506 (R/W)
Output 4 - Low Power Scale Set unit value for low power scale. This setting is the process power value when the analog output is at minimum.	Configuration Output 4		0 to 10000 % (two decimal places)	10000	519-520 (R/W) (/100)
Output 4 - High Power Scale Set unit value for high power scale. This setting is the process power value when the analog output is at maximum.	Configuration Output 4		0 to 10000 % (two decimal places)	10000	521-522 (R/W) (/100)
Output 4 - State Display state of output.	Monitor Device		Inactive (0) Active (1)	Inactive (0)	507 (R)
Output 4 - Output Direction Select whether the output will be for heating (reverse action) or cooling (direct action).	Configuration Output 4		Off (0) Heat (Indirect) (1) Cool (Direct) (2)	Off (0)	508 (R/W)
Output 4 - Logic Operator Select logic operation for event output.	Configuration Output 4		AND (0) OR (1)	AND (0)	509 (R/W)

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Output 4 - Output Source Alarm 1 Set to enable Alarm 1 source.	Configuration Output 4		No (0) Yes (1)	No (0)	510 (R/W)
Output 4 - Output Source Alarm 2 Set to enable Alarm 2 source.	Configuration Output 4		No (0) Yes (1)	No (0)	511 (R/W)
Output 4 - Output Source Alarm 3 Set to enable Alarm 3 source.	Configuration Output 4		No (0) Yes (1)	No (0)	512 (R/W)
Output 4 - Output Source Alarm 4 Set to enable Alarm 4 source.	Configuration Output 4		No (0) Yes (1)	No (0)	513 (R/W)
Output 4 - Output Source Alarm 5 Set to enable Alarm 5 source.	Configuration Output 4		No (0) Yes (1)	No (0)	514 (R/W)
Output 4 - Output Source Alarm 6 Set to enable Alarm 6 source.	Configuration Output 4		No (0) Yes (1)	No (0)	515 (R/W)
Output 4 - Output Source Alarm 7 Set to enable Alarm 7 source.	Configuration Output 4		No (0) Yes (1)	No (0)	516 (R/W)
Output 4 - Output Source Alarm 8 Set to enable Alarm 8 source.	Configuration Output 4		No (0) Yes (1)	No (0)	517 (R/W)
Output 4 - Output Logic Select output state in an alarm true condition.	Configuration Output 4		Energized (0) De-energized (1)	Energized (0)	518 (R/W)
Output 4 - Output Source Digital 3 Set to enable Digital Input 3 source.	Configuration Output 4		No (0) Yes (1)	No (0)	523 (R/W)
Output 4 - Output Source Digital 4 Set to enable Digital Input 4 source.	Configuration Output 4		No (0) Yes (1)	No (0)	524 (R/W)
Output 1-4 - Expected System Line Frequency Set the line frequency of the input power if the zero cross detection circuit fails.	Configuration Output 1 Configuration Output 2 Configuration Output 3 Configuration Output 4		50 Hz (0) 60 Hz (1)	60 Hz (0)	1075 (R/W)

Device Configuration > Alarms > Alarm 1

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Alarm 1 - Status Display status of Alarm 1.	Monitor Device Trend Information		Inactive (0) Active (1) Silenced (2)	Inactive (0)	103 (R)
Alarm 1 - Type Select alarm type. A process alarm responds when the temperature crosses a fixed value. A deviation alarm responds when the temperature deviates from the controlled set point by the alarm deviation set point. .	Monitor Device Configuration Alarm 1		Off (0) Low Process (1) High Process (2) Low Deviation (3) High Deviation (4) Low CT (5) High CT (6)	Off (0)	531 (R/W)
Alarm 1 - Process Alarm Source Select input where this alarm gets the information for comparison to the alarm set point.	Monitor Device Configuration Alarm 1		Process Value 1 (0) Process Value 2 (1)	Process Value 1 (0)	532 (R/W)
Alarm 1 - Process Alarm Set Point Set the alarm process set point in absolute degrees or units.	Monitor Device Trend Information Configuration Alarm 1		-30000000 to 30000000 degrees or units	0	106-107 (R/W) (/1000)
Alarm 1 - Deviation From Source Select control loop where this alarm gets the control set point for comparison to the alarm set point.	Configuration Alarm 1		Loop 1 (0) Loop 2 (1)	Loop 1 (0)	533 (R/W)
Alarm 1 - Deviation Alarm Set Point Set the alarm deviation set point in degrees or units from Set point.	Monitor Device Trend Information Configuration Alarm 1		-2000000200 to 2000000200 degrees or units	1	104-105 (R/W) (/1000)
Alarm 1 - CT Measurement Source Select source of current transformer measurement to generate Alarm 1.	Configuration Alarm 1		Off (0) Process Value 3 (2) Process Value 4 (3)	Process Value 4 (3)	534 (R/W)
Alarm 1 - CT Alarm Set Point Enter current transformer set point for Alarm 1 to activate.	Configuration Alarm 1		-30000000 to 30000000 units	0	108-109 (R/W) (/1000)

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Alarm 1 - Send Email Enable Select to enable an email to be sent upon activation of Alarm 1.	Configuration Alarm 1		No (0) Yes (1)	No (0)	(R/W)
Alarm 1 - Email Alert Subject Enter subject of email for Alarm 1. This message will appear in the subject line of the sent email.	Configuration Alarm 1		Up to 30 alpha-numeric characters		(R/W)
Alarm 1 - Alarm Hysteresis Select hysteresis value. Alarm hysteresis defines how far the process must return into the normal operating range before the alarm can clear.	Configuration Alarm 1		0 to 2000000200 degrees or units	3000	539-540 (R/W) (/1000)
Alarm 1 - Latching Enable Select to enable alarm to be latched. Latched alarms must be manually cleared when the process returns to a safe value.	Configuration Alarm 1		No (0) Yes (1)	No (0)	538 (R/W)
Alarm 1 - Latching Action Select to cause an active alarm to clear if latching is enabled and the process returns to a safe value.	Monitor Device		No (0) Yes (1)	No (0)	111 (R/W)
Alarm 1 - Silencing Enable Select to enable alarm silencing. Silencing allows the operator to disable alarm while the controller is in an alarm state.	Configuration Alarm 1		No (0) Yes (1)	No (0)	537 (R/W)
Alarm 1 - Silence Action Select to cause an active alarm to silence if silencing is enabled.	Monitor Device		No (0) Yes (1)	No (0)	110 (R/W)
Alarm 1 - Blocking Select to prevent a low alarm from triggering when the process temperature is initially lower than the alarm set point due to power on or set point change. Also applies to high alarms.	Configuration Alarm 1		Off (0) Set Point Change (1) Power On (2) Set Point Change and Power On (3)	Off (0)	536 (R/W)

Device Configuration > Alarms > Alarm 2

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Alarm 2 - Status Display status of Alarm 2.	Monitor Device Trend Information		Inactive (0) Active (1) Silenced (2)	Inactive (0)	116 (R)
Alarm 2 - Type Select alarm type. A process alarm responds when the temperature crosses a fixed value. A deviation alarm responds when the temperature deviates from the controlled set point by the alarm deviation set point.	Monitor Device Configuration Alarm 2		Off (0) Low Process (1) High Process (2) Low Deviation (3) High Deviation (4) Low CT (5) High CT (6)	Off (0)	545 (R/W)
Alarm 2 - Process Alarm Source Select input where this alarm gets the information for comparison to the alarm set point.	Monitor Device Configuration Alarm 2		Process Value 1 (0) Process Value 2 (1)	Process Value 1 (0)	546 (R/W)
Alarm 2 - Process Alarm Set Point Set the alarm process set point in absolute degrees or units.	Monitor Device Trend Information Configuration Alarm 2		-30000000 to 30000000 degrees or units	0	119-120 (R/W) (/1000)
Alarm 2 - Deviation From Source Select control loop where this alarm gets the control set point for comparison to the alarm set point.	Configuration Alarm 2		Loop 1 (0) Loop 2 (1)	Loop 1 (0)	547 (R/W)
Alarm 2 - Deviation Alarm Set Point Set the alarm deviation set point in degrees or units from set point.	Monitor Device Trend Information Configuration Alarm 2		-2000000200 to 2000000200 degrees or units	1	117-118 (R/W) (/1000)
Alarm 2 - CT Measurement Source Select source of current transformer measurement to generate Alarm 2.	Configuration Alarm 2		Off (0) Process Value 3 (2) Process Value 4 (3)	Process Value 4 (3)	548 (R/W)
Alarm 2 - CT Alarm Set Point Enter current transformer set point for Alarm 2 to activate.	Configuration Alarm 2		-30000000 to 30000000 units	0	121-122 (R/W) (/1000)

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Alarm 2 - Send Email Enable Select to enable an email to be sent on activation of Alarm 2.	Configuration Alarm 2		No (0) Yes (1)	No (0)	(R/W)
Alarm 2 - Email Alert Subject Enter subject of email for Alarm 2. This message will appear in the subject line of the sent email.	Configuration Alarm 2		Up to 30 alpha-numeric characters		(R/W)
Alarm 2 - Alarm Hysteresis Select hysteresis value. Alarm hysteresis defines how far the process must return into the normal operating range before the alarm can clear.	Configuration Alarm 2		0 to 2000000200 degrees or units	3000	553-554 (R/W) (/1000)
Alarm 2 - Latching Enable Select to enable alarm to be latched. Latched alarms must be manually cleared when the process returns to a safe value.	Configuration Alarm 2		No (0) Yes (1)	No (0)	552 (R/W)
Alarm 2 - Latching Action Select to cause an active alarm to clear if latching is enabled and the process returns to a safe value.	Monitor Device		No (0) Yes (1)	No (0)	124 (R/W)
Alarm 2 - Silencing Enable Select to enable alarm silencing. Silencing allows the operator to disable alarm while the controller is in an alarm state.	Configuration Alarm 2		No (0) Yes (1)	No (0)	551 (R/W)
Alarm 2 - Silence Action Select to cause an active alarm to silence if silencing is enabled.	Monitor Device		No (0) Yes (1)	No (0)	123 (R/W)
Alarm 2 - Blocking Select to prevent a low alarm from triggering when the process temperature is initially lower than the alarm set point due to power on or set point change. Also applies to high alarms.	Configuration Alarm 2		Off (0) Set Point Change (1) Power On (2) Set Point Change and Power On (3)	Off (0)	550 (R/W)

Device Configuration > Alarms > Alarm 3

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Alarm 3 - Status Display status of Alarm 3.	Monitor Device Trend Information		Inactive (0) Active (1) Silenced (2)	Inactive (0)	129 (R)
Alarm 3 - Type Select alarm type. A process alarm responds when the temperature crosses a fixed value. A deviation alarm responds when the temperature deviates from the controlled set point by the alarm deviation set point.	Monitor Device Configuration Alarm 3		Off (0) Low Process (1) High Process (2) Low Deviation (3) High Deviation (4) Low CT (5) High CT (6)	Off (0)	559 (R/W)
Alarm 3 - Process Alarm Source Select input where this alarm gets the information for comparison to the alarm set point.	Monitor Device Configuration Alarm 3		Process Value 1 (0) Process Value 2 (1)	Process Value 1 (0)	560 (R/W)
Alarm 3 - Process Alarm Set Point Set the alarm process set point in absolute degrees or units.	Monitor Device Trend Information Configuration Alarm 3		-30000000 to 30000000 degrees or units	0	132-133 (R/W) (/1000)
Alarm 3 - Deviation From Source Select control loop where this alarm gets the control set point for comparison to the alarm set point.	Configuration Alarm 3		Loop 1 (0) Loop 2 (1)	Loop 1 (0)	561 (R/W)
Alarm 3 - Deviation Alarm Set Point Set the alarm deviation set point in degrees or units from set point.	Monitor Device Trend Information Configuration Alarm 3		-2000000200 to 2000000200 degrees or units	1	130-131 (R/W) (/1000)
Alarm 3 - CT Measurement Source Select source of current transformer measurement to generate Alarm 3.	Configuration Alarm 3		Off (0) Process Value 3 (2) Process Value 4 (3)	Process Value 4 (3)	562 (R/W)
Alarm 3 - CT Alarm Set Point Enter current transformer set point for Alarm 3 to activate.	Configuration Alarm 3		-30000000 to 30000000 units	0	134-135 (R/W) (/1000)

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Alarm 3 - Send Email Enable Select to enable an email to be sent on activation of Alarm 3.	Configuration Alarm 3		No (0) Yes (1)	No (0)	(R/W)
Alarm 3 - Email Alert Subject Enter subject of email for Alarm 3. This message will appear in the subject line of the sent email.	Configuration Alarm 3		Up to 30 alpha-numeric characters		(R/W)
Alarm 3 - Alarm Hysteresis Select hysteresis value. Alarm hysteresis defines how far the process must return into the normal operating range before the alarm can clear.	Configuration Alarm 3		0 to 2000000200 degrees or units	3000	567-568 (R/W) (/1000)
Alarm 3 - Latching Enable Select to enable alarm to be latched. Latched alarms must be manually cleared when the process returns to a safe value.	Configuration Alarm 3		No (0) Yes (1)	No (0)	566 (R/W)
Alarm 3 - Latching Action Select to cause an active alarm to clear if latching is enabled and the process returns to a safe value.	Monitor Device		No (0) Yes (1)	No (0)	137 (R/W)
Alarm 3 - Silencing Enable Select to enable alarm silencing. Silencing allows the operator to disable alarm while the controller is in an alarm state.	Configuration Alarm 3		No (0) Yes (1)	No (0)	565 (R/W)
Alarm 3 - Silence Action Select to cause an active alarm to silence if silencing is enabled.	Monitor Device		No (0) Yes (1)	No (0)	136 (R/W)
Alarm 3 - Blocking Select to prevent a low alarm from triggering when the process temperature is initially lower than the alarm set point due to Power On or Set Point change. Also applies to high alarms.	Configuration Alarm 3		Off (0) Set Point Change (1) Power On (2) Set Point Change and Power On (3)	Off (0)	564 (R/W)

Device Configuration > Alarms > Alarm 4

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Alarm 4 - Status Display status of Alarm 4.	Monitor Device Trend Information		Inactive (0) Active (1) Silenced (2)	Inactive (0)	142 (R)
Alarm 4 - Type Select alarm type. A process alarm responds when the temperature crosses a fixed value. A deviation alarm responds when the temperature deviates from the controlled set point by the alarm deviation set point.	Monitor Device Configuration Alarm 4		Off (0) Low Process (1) High Process (2) Low Deviation (3) High Deviation (4) Low CT (5) High CT (6)	Off (0)	573 (R/W)
Alarm 4 - Process Alarm Source Select input where this alarm gets the information for comparison to the alarm set point.	Monitor Device Configuration Alarm 4		Process Value 1 (0) Process Value 2 (1)	Process Value 1 (0)	574 (R/W)
Alarm 4 - Process Alarm Set Point Set the alarm process set point in absolute degrees or units.	Monitor Device Trend Information Configuration Alarm 4		-30000000 to 30000000 degrees or units	0	145-146 (R/W) (/1000)
Alarm 4 - Deviation From Source Select control loop where this alarm gets the control set point for comparison to the alarm set point.	Configuration Alarm 4		Loop 1 (0) Loop 2 (1)	Loop 1 (0)	575 (R/W)
Alarm 4 - Deviation Alarm Set Point Set the alarm deviation set point in degrees or units from set point.	Monitor Device Trend Information Configuration Alarm 4		-2000000200 to 2000000200 degrees or units	1	143-144 (R/W) (/1000)
Alarm 4 - CT Measurement Source Select source of current transformer measurement to generate Alarm 4.	Configuration Alarm 4		Off (0) Process Value 3 (2) Process Value 4 (3)	Process Value 4 (3)	576 (R/W)
Alarm 4 - CT Alarm Set Point Enter current transformer set point for Alarm 4 to activate.	Configuration Alarm 4		-30000000 to 30000000 units	0	147-148 (R/W) (/1000)

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Alarm 4 - Send Email Enable Select to enable an email to be sent on activation of Alarm 4.	Configuration Alarm 4		No (0) Yes (1)	No (0)	(R/W)
Alarm 4 - Email Alert Subject Enter subject of email for Alarm 4. This message will appear in the subject line of the sent email.	Configuration Alarm 4		Up to 30 alpha-numeric characters		(R/W)
Alarm 4 - Alarm Hysteresis Select hysteresis value. Alarm hysteresis defines how far the process must return into the normal operating range before the alarm can clear.	Configuration Alarm 4		0 to 2000000200 degrees or units	3000	581-582 (R/W) (/1000)
Alarm 4 - Latching Enable Select to enable alarm to be latched. Latched alarms must be manually cleared when the process returns to a safe value.	Configuration Alarm 4		No (0) Yes (1)	No (0)	580 (R/W)
Alarm 4 - Latching Action Select to cause an active alarm to clear if latching is enabled and the process returns to a safe value.	Monitor Device		No (0) Yes (1)	No (0)	150 (R/W)
Alarm 4 - Silencing Enable Select to enable alarm silencing. Silencing allows the operator to disable alarm while the controller is in an alarm state.	Configuration Alarm 4		No (0) Yes (1)	No (0)	579 (R/W)
Alarm 4 - Silence Action Select to cause an active alarm to silence if silencing is enabled.	Monitor Device		No (0) Yes (1)	No (0)	149 (R/W)
Alarm 4 - Blocking Select to prevent a low alarm from triggering when the process temperature is initially lower than the alarm set point due to power on or set point change. Also applies to high alarms.	Configuration Alarm 4		Off (0) Set Point Change (1) Power On (2) Set Point Change and Power On (3)	Off (0)	578 (R/W)

Device Configuration > Alarms > Alarm 5

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Alarm 5 - Status Display status of Alarm 5.	Monitor Device Trend Information		Inactive (0) Active (1) Silenced (2)	Inactive (0)	155 (R)
Alarm 5 - Type Select alarm type. A process alarm responds when the temperature crosses a fixed value. A deviation alarm responds when the temperature deviates from the controlled set point by the alarm deviation set point.	Monitor Device Configuration Alarm 5		Off (0) Low Process (1) High Process (2) Low Deviation (3) High Deviation (4) Low CT (5) High CT (6)	Off (0)	587 (R/W)
Alarm 5 - Process Alarm Source Select input where this alarm gets the information for comparison to the alarm set point.	Monitor Device Configuration Alarm 5		Process Value 1 (0) Process Value 2 (1)	Process Value 1 (0)	588 (R/W)
Alarm 5 - Process Alarm Set Point Set the alarm process set point in absolute degrees or units.	Monitor Device Trend Information Configuration Alarm 5		-30000000 to 30000000 degrees or units	0	158-159 (R/W) (/1000)
Alarm 5 - Deviation From Source Select control loop where this alarm gets the control set point for comparison to the alarm set point.	Configuration Alarm 5		Loop 1 (0) Loop 2 (1)	Loop 1 (0)	589 (R/W)
Alarm 5 - Deviation Alarm Set Point Set the alarm deviation set point in degrees or units from set point.	Monitor Device Trend Information Configuration Alarm 5		-2000000200 to 2000000200 degrees or units	1	156-157 (R/W) (/1000)
Alarm 5 - CT Measurement Source Select source of current transformer measurement to generate Alarm 5.	Configuration Alarm 5		Off (0) Process Value 3 (2) Process Value 4 (3)	Process Value 4 (3)	590 (R/W)
Alarm 5 - CT Alarm Set Point Enter current transformer set point for Alarm 5 to activate.	Configuration Alarm 5		-30000000 to 30000000 units	0	160-161 (R/W) (/1000)

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Alarm 5 - Send Email Enable Select to enable an email to be sent on activation of Alarm 5.	Configuration Alarm 5		No (0) Yes (1)	No (0)	(R/W)
Alarm 5 - Email Alert Subject Enter subject of email for Alarm 5. This message will appear in the subject line of the sent email.	Configuration Alarm 5		Up to 30 alpha-numeric characters		(R/W)
Alarm 5 - Alarm Hysteresis Select hysteresis value. Alarm hysteresis defines how far the process must return into the normal operating range before the alarm can clear.	Configuration Alarm 5		0 to 2000000200 degrees or units	3000	595-596 (R/W) (/1000)
Alarm 5 - Latching Enable Select to enable alarm to be latched. Latched alarms must be manually cleared when the process returns to a safe value.	Configuration Alarm 5		No (0) Yes (1)	No (0)	594 (R/W)
Alarm 5 - Latching Action Select to cause an active alarm to clear if latching is enabled and the process returns to a safe value.	Monitor Device		No (0) Yes (1)	No (0)	163 (R/W)
Alarm 5 - Silencing Enable Select to enable alarm silencing. Silencing allows the operator to disable alarm while the controller is in an alarm state.	Configuration Alarm 5		No (0) Yes (1)	No (0)	593 (R/W)
Alarm 5 - Silence Action Select to cause an active alarm to silence if silencing is enabled.	Monitor Device		No (0) Yes (1)	No (0)	162 (R/W)
Alarm 5 - Blocking Select to prevent a low alarm from triggering when the process temperature is initially lower than the alarm set point due to power on or set point change. Also applies to high alarms.	Configuration Alarm 5		Off (0) Set Point Change (1) Power On (2) Set Point Change and Power On (3)	Off (0)	592 (R/W)

Device Configuration > Alarms > Alarm 6

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Alarm 6 - Status Display status of Alarm 6.	Monitor Device Trend Information		Inactive (0) Active (1) Silenced (2)	Inactive (0)	168 (R)
Alarm 6 - Type Select alarm type. A process alarm responds when the temperature crosses a fixed value. A deviation alarm responds when the temperature deviates from the controlled set point by the alarm deviation set point.	Monitor Device Configuration Alarm 6		Off (0) Low Process (1) High Process (2) Low Deviation (3) High Deviation (4) Low CT (5) High CT (6)	Off (0)	601 (R/W)
Alarm 6 - Process Alarm Source Select input where this alarm gets the information for comparison to the alarm set point.	Monitor Device Configuration Alarm 6		Process Value 1 (0) Process Value 2 (1)	Process Value 1 (0)	602 (R/W)
Alarm 6 - Process Alarm Set Point Set the alarm process set point in absolute degrees or units.	Monitor Device Trend Information Configuration Alarm 6		-30000000 to 30000000 degrees or units	0	171-172 (R/W) (/1000)
Alarm 6 - Deviation From Source Select control loop where this alarm gets the control set point for comparison to the alarm set point.	Configuration Alarm 6		Loop 1 (0) Loop 2 (1)	Loop 1 (0)	603 (R/W)
Alarm 6 - Deviation Alarm Set Point Set the alarm deviation set point in degrees or units from set point.	Monitor Device Trend Information Configuration Alarm 6		-2000000200 to 2000000200 degrees or units	1	169-170 (R/W) (/1000)
Alarm 6 - CT Measurement Source Select source of current transformer measurement to generate Alarm 6.	Configuration Alarm 6		Off (0) Process Value 3 (2) Process Value 4 (3)	Process Value 4 (3)	604 (R/W)
Alarm 6 - CT Alarm Set Point Enter current transformer set point for Alarm 6 to activate.	Configuration Alarm 6		-30000000 to 30000000 units	0	173-174 (R/W) (/1000)

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Alarm 6 - Send Email Enable Select to enable an email to be sent on activation of Alarm 6.	Configuration Alarm 6		No (0) Yes (1)	No (0)	(R/W)
Alarm 6 - Email Alert Subject Enter subject of email for Alarm 6. This message will appear in the subject line of the sent email.	Configuration Alarm 6		Up to 30 alpha-numeric characters		(R/W)
Alarm 6 - Alarm Hysteresis Select hysteresis value. Alarm hysteresis defines how far the process must return into the normal operating range before the alarm can clear.	Configuration Alarm 6		0 to 2000000200 degrees or units	3000	609-610 (R/W) (/1000)
Alarm 6 - Latching Enable Select to enable alarm to be latched. Latched alarms must be manually cleared when the process returns to a safe value.	Configuration Alarm 6		No (0) Yes (1)	No (0)	608 (R/W)
Alarm 6 - Latching Action Select to cause an active alarm to clear if latching is enabled and the process returns to a safe value.	Monitor Device		No (0) Yes (1)	No (0)	176 (R/W)
Alarm 6 - Silence Enable Select to enable alarm silencing. Silencing allows the operator to disable alarm while the controller is in an alarm state.	Configuration Alarm 6		No (0) Yes (1)	No (0)	607 (R/W)
Alarm 6 - Silence Action Select to cause an active alarm to silence if silencing is enabled.	Monitor Device		No (0) Yes (1)	No (0)	175 (R/W)
Alarm 6 - Blocking Select to prevent a low alarm from triggering when the process temperature is initially lower than the alarm set point due to power on or set point change. Also applies to high alarms.	Configuration Alarm 6		Off (0) Set Point Change (1) Power On (2) Set Point Change and Power On (3)	Off (0)	606 (R/W)

Device Configuration > Alarms > Alarm 7

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Alarm 7 - Status Display status of Alarm 7.	Monitor Device Trend Information		Inactive (0) Active (1) Silenced (2)	Inactive (0)	181 (R)
Alarm 7 - Type Select alarm type. A process alarm responds when the temperature crosses a fixed value. A deviation alarm responds when the temperature deviates from the controlled set point by the alarm deviation set point.	Monitor Device Configuration Alarm 7		Off (0) Low Process (1) High Process (2) Low Deviation (3) High Deviation (4) Low CT (5) High CT (6)	Off (0)	615 (R/W)
Alarm 7 - Process Alarm Source Select input where this alarm gets the information for comparison to the alarm set point.	Monitor Device Configuration Alarm 7		Process Value 1 (0) Process Value 2 (1)	Process Value 1 (0)	616 (R/W)
Alarm 7 - Process Alarm Set Point Set the alarm process set point in absolute degrees or units.	Monitor Device Trend Information Configuration Alarm 7		-30000000 to 30000000 degrees or units	0	184-185 (R/W) (/1000)
Alarm 7 - Deviation From Source Select control loop where this alarm gets the control set point for comparison to the alarm set point.	Configuration Alarm 7		Loop 1 (0) Loop 2 (1)	Loop 1 (0)	617 (R/W)
Alarm 7 - Deviation Alarm Set Point Set the alarm deviation set point in degrees or units from set point.	Monitor Device Trend Information Configuration Alarm 7		-2000000200 to 2000000200 degrees or units	1	182-183 (R/W) (/1000)
Alarm 7 - CT Measurement Source Select source of current transformer measurement to generate Alarm 7.	Configuration Alarm 7		Off (0) Process Value 3 (2) Process Value 4 (3)	Process Value 4 (3)	618 (R/W)
Alarm 7 - CT Alarm Set Point Enter current transformer set point for Alarm 7 to activate.	Configuration Alarm 7		-30000000 to 30000000 units	0	186-187 (R/W) (/1000)

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Alarm 7 - Send Email Enable Select to enable an email to be sent on activation of Alarm 7.	Configuration Alarm 7		No (0) Yes (1)	No (0)	(R/W)
Alarm 7 - Email Alert Subject Enter subject of email for Alarm 7. This message will appear in the subject line of the sent email.	Configuration Alarm 7		Up to 30 alpha-numeric characters		(R/W)
Alarm 7 - Alarm Hysteresis Select hysteresis value. Alarm hysteresis defines how far the process must return into the normal operating range before the alarm can clear.	Configuration Alarm 7		0 to 2000000200 degrees or units	3000	623-624 (R/W) (/1000)
Alarm 7 - Latching Enable Select to enable alarm to be latched. Latched alarms must be manually cleared when the process returns to a safe value.	Configuration Alarm 7		No (0) Yes (1)	No (0)	622 (R/W)
Alarm 7 - Latching Action Select to cause an active alarm to clear if latching is enabled and the process returns to a safe value.	Monitor Device		No (0) Yes (1)	No (0)	189 (R/W)
Alarm 7 - Silencing Enable Select to enable alarm silencing. Silencing allows the operator to disable alarm while the controller is in an alarm state.	Configuration Alarm 7		No (0) Yes (1)	No (0)	621 (R/W)
Alarm 7 - Silence Action Select to cause an active alarm to silence if silencing is enabled.	Monitor Device		No (0) Yes (1)	No (0)	188 (R/W)
Alarm 7 - Blocking Select to prevent a low alarm from triggering when the process temperature is initially lower than the alarm set point due to power on or set point change. Also applies to high alarms.	Configuration Alarm 7		Off (0) Set Point Change (1) Power On (2) Set Point Change and Power On (3)	Off (0)	620 (R/W)

Device Configuration > Alarms > Alarm 8

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Alarm 8 - Status Display status of Alarm 8.	Monitor Device Trend Information		Inactive (0) Active (1) Silenced (2)	Inactive (0)	194 (R)
Alarm 8 - Type Select alarm type. A process alarm responds when the temperature crosses a fixed value. A deviation alarm responds when the temperature deviates from the controlled set point by the alarm deviation set point.	Monitor Device Configuration Alarm 8		Off (0) Low Process (1) High Process (2) Low Deviation (3) High Deviation (4) Low CT (5) High CT (6)	Off (0)	629 (R/W)
Alarm 8 - Process Alarm Source Select input where this alarm gets the information for comparison to the alarm set point.	Monitor Device Configuration Alarm 8		Process Value 1 (0) Process Value 2 (1)	Process Value 1 (0)	630 (R/W)
Alarm 8 - Process Alarm Set Point Set the alarm process set point in absolute degrees or units.	Monitor Device Trend Information Configuration Alarm 8		-30000000 to 30000000 degrees or units	0	197-198 (R/W) (/1000)
Alarm 8 - Deviation From Source Select control loop where this alarm gets the control set point for comparison to the alarm set point.	Configuration Alarm 8		Loop 1 (0) Loop 2 (1)	Loop 1 (0)	631 (R/W)
Alarm 8 - Deviation Alarm Set Point Set the alarm deviation set point in degrees or units from set point.	Monitor Device Trend Information Configuration Alarm 8		-2000000200 to 2000000200 degrees or units	1	195-196 (R/W) (/1000)
Alarm 8 - CT Measurement Source Select source of current transformer measurement to generate Alarm 8.	Configuration Alarm 8		Off (0) Process Value 3 (2) Process Value 4 (3)	Process Value 4 (3)	632 (R/W)
Alarm 8 - CT Alarm Set Point Enter current transformer set point for Alarm 8 to activate.	Configuration Alarm 8		-30000000 to 30000000 units	0	199-200 (R/W) (/1000)

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Alarm 8 - Send Email Enable Select to enable an email to be sent on activation of Alarm 8.	Configuration Alarm 8		No (0) Yes (1)	No (0)	(R/W)
Alarm 8 - Email Alert Subject Enter subject of email for Alarm 8. This message will appear in the subject line of the sent email.	Configuration Alarm 8		Up to 30 alpha-numeric characters		(R/W)
Alarm 8 - Alarm Hysteresis Select hysteresis value. Alarm hysteresis defines how far the process must return into the normal operating range before the alarm can clear.	Configuration Alarm 8		0 to 2000000200 degrees or units	3000	637-638 (R/W) (/1000)
Alarm 8 - Latching Enable Select to enable alarm to be latched. Latched alarms must be manually cleared when the process returns to a safe value.	Configuration Alarm 8		No (0) Yes (1)	No (0)	636 (R/W)
Alarm 8 - Latching Action Select to cause an active alarm to clear if latching is enabled and the process returns to a safe value.	Monitor Device		No (0) Yes (1)	No (0)	202 (R/W)
Alarm 8 - Silencing Enable Select to enable alarm silencing. Silencing allows the operator to disable alarm while the controller is in an alarm state.	Configuration Alarm 8		No (0) Yes (1)	No (0)	635 (R/W)
Alarm 8 - Silence Action Select to cause an active alarm to silence if silencing is enabled.	Monitor Device		No (0) Yes (1)	No (0)	201 (R/W)
Alarm 8 - Blocking Select to prevent a low alarm from triggering when the process temperature is initially lower than the alarm set point due to power on or set point change. Also applies to high alarms.	Configuration Alarm 8		Off (0) Set Point Change (1) Power On (2) Set Point Change and Power On (3)	Off (0)	634 (R/W)

Device Configuration > Network > Email

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Email - SMTP Server Name Specify email SMTP server name.	Configuration Network Email			0	(R/W)
Email - SMTP Server IP Resolution Specify preference to determine SMTP server IP resolution.	Configuration Network Email		Get Server IP From Server Name (0) Fixed Server Address (1)	Get Server IP From Server Name (0)	(R/W)
Email - SMTP Server Fixed Address Specify SMTP server fixed IP address.	Configuration Network Email		-2147483647 to 2147483647	-1062731775	(R/W)
Email - Source Email Address Specify return source of submitted email. This source is included in sent emails.	Configuration Network Email		Up to 30 alpha-numeric characters	0	(R/W)
Email - Email Recipient 1 Specify an email recipient. Up to four mail boxes may receive an email.	Configuration Network Email		Up to 30 alpha-numeric characters	0	(R/W)
Email - Email Recipient 2 Specify an email recipient. Up to four mail boxes may receive an email.	Configuration Network Email		Up to 30 alpha-numeric characters	0	(R/W)
Email - Email Recipient 3 Specify an email recipient. Up to four mail boxes may receive an email.	Configuration Network Email		Up to 30 alpha-numeric characters	0	(R/W)
Email - Email Recipient 4 Specify an email recipient. Up to four mail boxes may receive an email.	Configuration Network Email		Up to 30 alpha-numeric characters	0	(R/W)

Device Configuration > Network > Security

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Security - Monitor User Name Identify the User Name for password protection of the Monitor page.	Configuration Security				(R/W)
Security - Monitor Password Identify the Password for access to the Monitor page.	Configuration Security				(R/W)
Security - Configuration User Name Identify the User Name for password protection of the Configuration page.	Configuration Security				(R/W)
Security - Configuration Password Identify the Password for access to the Configuration page.	Configuration Security				(R/W)
Security - Administration User Name Identify the User Name for password protection of the Calibration page.	Configuration Security				(R/W)
Security - Administration Password Identify the Password for access to the Calibration page.	Configuration Security				(R/W)

Device Configuration > Datalogging > Settings

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Datalog - Enabled Enable datalogging.	Configuration Datalogging Settings		No (0) Yes (1)	No (0)	1209 (R/W)
Datalog - Logging Interval Specify the timed intervals of datalog updates.	Configuration Datalogging Settings		1 to 200	1	1189-1190 (R/W) (/1000)
Datalog - Logging Interval Units Specify the units for the datalogging interval.	Configuration Datalogging Settings		Seconds Minutes	Seconds	(R/W)
Datalog - Datalog File Compression Select to enable datalog file compression.	Configuration Datalogging Settings		No (0) Yes (1)	No (0)	1218 (R/W)
Datalog - TFTP Transfer Interval Specify the time intervals of data transfers to the TFTP server.	Configuration Datalogging Settings		1 to 999 seconds or minutes	60	(R/W)
Datalog - When Log File is Full Action Specify the action to be taken when the datalog file is full.	Configuration Datalogging Settings		Overwrite starting at first file Stop Logging	Overwrite	(R/W)
Datalog - Write Log File to TFTP Server Enable datalog files to go to TFTP server when files are full.	Configuration Datalogging Settings		No Yes	No	(R/W)
Datalog - TFTP Server Name Enter the TFTP Server Name where datalog files will be transferred.	Configuration Datalogging Settings				(R/W)
Datalog - TFTP Server IP Enter the TFTP Server IP address where datalog files will be transferred.	Configuration Datalogging Settings		-2147483647 to 2147483647	-1062731775	(R/W)
Datalog - Delete All Datalog Files Select to clear current datalog file.	Configuration Datalogging Settings		No (0) Yes (1)	No (0)	1210 (R/W)

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Datalog - Log Active Process Value 1 Specify to include Analog Input 1 Active Process in datalog.	Configuration Data-logging Settings		No (0) Yes (1)	No (0)	1191 (R/W)
Datalog - Log Active Process Value 2 Specify to include Analog Input 2 Active Process in datalog.	Configuration Data-logging Settings		No (0) Yes (1)	No (0)	1192 (R/W)
Datalog - Log Active Process Value 3 Specify to include Analog Input 3 Active Process in datalog.	Configuration Data-logging Settings		No (0) Yes (1)	No (0)	1193 (R/W)
Datalog - Log Active Process Value 4 Specify to include Analog Input 4 Active Process in datalog.	Configuration Data-logging Settings		No (0) Yes (1)	No (0)	1194 (R/W)
Datalog - Log Working Set Point 1 Specify to include Loop 1 Working Set Point in datalog.	Configuration Data-logging Settings		No (0) Yes (1)	No (0)	1195 (R/W)
Datalog - Log Working Set Point 2 Specify to include Loop 2 Working Set Point in datalog.	Configuration Data-logging Settings		No (0) Yes (1)	No (0)	1196 (R/W)
Datalog - Log Loop Power 1 Specify to include Loop 1 Power output in datalog.	Configuration Data-logging Settings		No (0) Yes (1)	No (0)	1199 (R/W)
Datalog - Log Loop Power 2 Specify to include Loop 2 Power output in datalog.	Configuration Data-logging Settings		No (0) Yes (1)	No (0)	1200 (R/W)
Datalog - Log Alarm 1 Status Specify to include Alarm 1 Status in datalog.	Configuration Data-logging Settings		No (0) Yes (1)	No (0)	1201 (R/W)
Datalog - Log Alarm 2 Status Specify to include Alarm 2 Status in datalog.	Configuration Data-logging Settings		No (0) Yes (1)	No (0)	1202 (R/W)

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Datalog - Log Alarm 3 Status Specify to include Alarm 3 Status in datalog.	Configuration Data-logging Settings		No (0) Yes (1)	No (0)	1203 (R/W)
Datalog - Log Alarm 4 Status Specify to include Alarm 4 Status in datalog.	Configuration Data-logging Settings		No (0) Yes (1)	No (0)	1204 (R/W)
Datalog - Log Alarm 5 Status Specify to include Alarm 5 Status in datalog.	Configuration Data-logging Settings		No (0) Yes (1)	No (0)	1205 (R/W)
Datalog - Log Alarm 6 Status Specify to include Alarm 6 Status in datalog.	Configuration Data-logging Settings		No (0) Yes (1)	No (0)	1206 (R/W)
Datalog - Log Alarm 7 Status Specify to include Alarm 7 Status in datalog.	Configuration Data-logging Settings		No (0) Yes (1)	No (0)	1207 (R/W)
Datalog - Log Alarm 8 Status Specify to include Alarm 8 Status in datalog.	Configuration Data-logging Settings		No (0) Yes (1)	No (0)	1208 (R/W)
Datalog - Log Digital Input 3 Status Specify to include Digital Input 3 Status in datalog.	Configuration Data-logging Settings		No (0) Yes (1)	No (0)	1197 (R/W)
Datalog - Log Digital Input 4 Status Specify to include Digital Input 4 Status in datalog.	Configuration Data-logging Settings		No (0) Yes (1)	No (0)	1198 (R/W)

Device Configuration > Datalogging > Clock

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Real Time Clock - Current Time Display current stored Time	Configuration Datalogging Clock		Hours:Minutes:Seconds:AM/PM		(R)
Real Time Clock - Current Date Display current stored Date	Configuration Datalogging Clock		Month/Day/Year		(R)
Real Time Clock - Time Zone Display stored time zone.	Configuration Datalogging Clock		Up to four alpha characters.	0	(R/W)
Real Time Clock - Enable Synchronize with Server Enable real time clock to automatically synchronize with a time server.	Configuration Datalogging Clock		No Yes	No	(R/W)
Real Time Clock - Server IP Resolution Selects the method for assigning the clock server IP address..	Configuration Datalogging Settings		Server IP Resolution via DCHP Server IP Resolution via Server Name Server IP Resolution via Fixed Address	Server IP Resolution via DCHP	(R/W)
Real Time Clock - Server Name Specify real time server name.	Configuration Datalogging Clock			0	(R/W)
Real Time Clock - Server Fixed IP Address. Specify real time server fixed IP address.	Configuration Datalogging Clock		-2147483647 to 2147483647	1	(R/W)

Hardware

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Hardware - Number of Digital Inputs Implemented Display number of digital inputs implemented.	Device Information		0 to 2	0	19 (R)
Hardware - Analog Input 1 Type Display analog input 1 hardware type.	Device Information		Universal (1)	Universal (1)	1043 (R)
Hardware - Analog Input 2 Type Display analog input 2 hardware type.	Device Information		None (0) Universal (1)	None (0)	1044 (R)
Hardware - Digital Input 3 Type Display digital input 3 hardware type.	Device Information		None (0) Dry Contact (1)	None (0)	1047 (R)
Hardware - Digital Input 4 Type Display digital input 4 hardware type.	Device Information		None (0) Dry Contact (1)	None (0)	1048 (R)
Hardware - CT Input 3 Type Display analog input 3 hardware type.	Device Information		None (0) Current Transformer (2)	None (0)	1045 (R)
Hardware - CT Input 4 Type Display analog input 4 hardware type.	Device Information		None (0) Current Transformer (2)	None (0)	1046 (R)
Hardware - Output 1 Type Display Output 1 hardware type.	Device Information		Switched DC (1) SSR (2) Process (3) Relay A (4)	Switched DC (1)	1049 (R)
Hardware - Output 2 Type Display Output 2 hardware type.	Device Information		None (0) Switched DC (1) SSR (2) Relay C (5)	None (0)	1050 (R)
Hardware - Output 3 Type Display Output 3 hardware type.	Device Information		None (0) Switched DC (1) SSR (2) Process (3) Relay A (4)	None (0)	1051 (R)
Hardware - Output 4 Type Display Output 4 hardware type.	Device Information		None (0) Switched DC (1) SSR (2) Process (3) Relay C (5)	None (0)	1052 (R)

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Hardware - Number of Possible Analog Inputs Display total number of analog inputs available.	Device Information		1 to 4	1	(R)
Hardware - Number of Possible Digital Inputs Display total number of digital inputs available.	Device Information		0 to 2	0	(R)
Hardware - Number of Possible Outputs Display total number of outputs available.	Device Information		1 to 4	1	(R)
Hardware - Number of Analog Inputs Implemented Display number of analog inputs implemented.	Device Information		1 to 4	1	18 (R)
Hardware - Number of Outputs Implemented Display number of outputs implemented.	Device Information		1 to 4	1	20 (R)
Hardware - Date Code Identifies the manufacture date.	Device Information		-2147483647 to 2147483647	0	9 (R)
Hardware - Serial Number Identifies the individual controllers' serial number.	Device Information		0 to 2000000200	0	7-8 (R)
Hardware - CJC Temperature 1 Display the cold junction compensation temperature.	Device Information		32000 to 167000 degrees	32000	1015-1016 (R) (/1000)
Hardware - CJC Temperature 2 Display the cold junction compensation temperature.	Device Information		32000 to 167000 degrees	32000	1019-1020 (R) (/1000)

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Hardware - Analog Input 1 Counts Display the A/D counts.	Device Information		0 to 65535	0	1001-1002 (R)
Hardware - Analog Input 2 Counts Display the A/D counts.	Device Information		0 to 65535	0	1003-1004 (R)
Hardware - Analog Input 3 Counts Display the A/D counts.	Device Information		0 to 65535	0	1005-1006 (R)
Hardware - Analog Input 4 Counts Display the A/D counts.	Device Information		0 to 65535	0	1007-1008 (R)
Hardware - Analog Out 1 Process Value Indicates the process output value for Output 1.	Device Information		-2000000200 to 2000000200 units	0	1023-1024 (R) (/1000)
Hardware - Analog Out 3 Process Value Indicates the process output value for Output 3.	Device Information		-2000000200 to 2000000200 units	0	1027-1028 (R) (/1000)

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Hardware - Net Fixed IP Identifies the Fixed IP address to use if selected.	Configuration Network		-2147483647 to 2147483647	-1062731775	(R/W)
Hardware - Net Fixed Subnet Identifies the Fixed Subnet mask to use if selected.	Configuration Network		-2147483647 to 2147483647	-65536	(R/W)
Hardware - Net Fixed Gateway Identifies the Fixed Gateway IP address.	Configuration Network		-2147483647 to 2147483647	-1062731775	(R/W)
Hardware - Net Fixed DNS Identifies the Fixed DNS server address.	Configuration Network		-2147483647 to 2147483647	-1062731775	(R/W)
Hardware - Part Number Display the controllers's part number.	Device Information Configuration Network				(R/W)
Hardware - Actual IP Identifies the IP address currently being utilized.	Configuration Network		-2147483647 to 2147483647	1	(R)
Hardware - Actual Subnet Identifies the IP Subnet mask currently being utilized.	Configuration Network		-2147483647 to 2147483647	1	(R)
Hardware - Actual Gateway Identifies the Gateway IP address currently being utilized.	Configuration Network		-2147483647 to 2147483647	1	(R)
Hardware - Actual DNS Identifies the DNS server IP address currently being utilized.	Configuration Network		-2147483647 to 2147483647	1	(R)
Hardware - MAC Address String Identifies the MAC address of the controller.	Configuration Network				(R)

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Hardware - Device Name Identifies the controllers' name. The controller can be browsed using this name via NetBIOS.	Configuration Network		0		(R/W)
Hardware - Device Watlow Name Identifies the controllers' Watlow name. The controller can be browsed using this name.	Device Information		0		(R)
Hardware - Device Name Identifies the controllers' name. The controller can be browsed using this name via NetBIOS.	Configuration Network		0		(R/W)
Hardware - Device Always Name Identifies the name that controller can always be accessed via NetBIOS.	Device Information		0		(R)
Hardware - Net IP Resolution Identifies the order of obtaining the controllers' IP address.	Configuration Network		Try DHCP server, then use Auto IP, then use fixed IP address (0) Try DHCP server, then use fixed IP address (1) Try Auto IP, then use fixed IP address (2) Use Fixed IP address (3)	Try DHCP server then use fixed IP address (0)	(R/W)

Firmware

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Firmware - Build Identifies the firmware build number.	Device Information		0 to 32767		13 (R)
Firmware - ID Identifies the firmware ID number.	Device Information		0 to 32767		10 (R)
Firmware - Branch Identifies the firmware branch number.	Device Information		0 to 32767		14 (R)
Firmware - Prototype Version Identifies the firmware prototype version.	Device Information		0 to 32767		12 (R)
Firmware - Number of Alarms Possible Display total number of alarms available.	Device Information		8 to 8	8	(R)
Firmware - Number of Possible Control Loops Display total number of control loops available.	Device Information		1 to 2	1	(R)
Firmware - Number of PID Sets Possible Display total number of PID sets available.	Device Information		1 to 5	5	(R)
Firmware - Number of PID Sets Implemented Display number of PID sets implemented.	Device Information		1 to 5	5	23 (R)
Firmware - Software Released Revision Identifies the software revision.	Device Information		0 to 32767		11 (R)
Firmware - Number of Alarms Implemented Display number of alarms implemented.	Device Information		0 to 8	8	21 (R)
Firmware - Number of Control Loops Display number of control loops.	Device Information		1 to 2	1	22 (R)

Parameter Name and Description	Web Page	Your Settings	Range	Default	Modbus* (Read/write and scaling)
Firmware - Bit Pattern 1 Always returns 55 hex.	Device Information		Hex Value		1 (R)
Firmware - Bit Pattern 2 Always returns AA hex.	Device Information		Hex Value		2 (R)
Firmware - ASCII '12' Always returns 12 ASCII.	Device Information		String Value		3 (R)
Firmware - ASCII '34' Always returns 34 ASCII.	Device Information		String Value		4 (R)
Firmware - Save User Settings Select to save user settings to EEPROM.	Calibration Analog Input 1		No (0) Yes (1)	No (0)	1061 (R/W)

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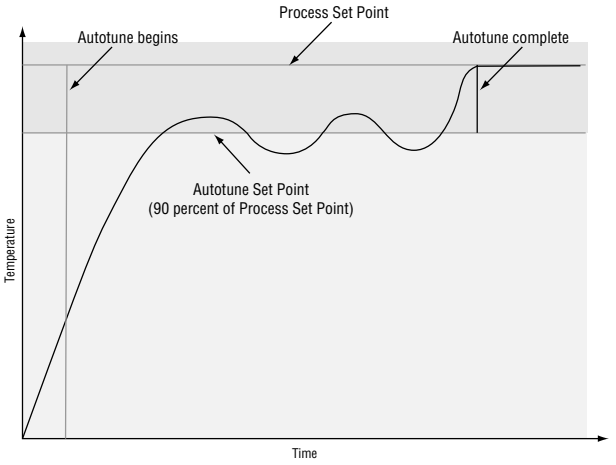
Autotuning

The autotuning feature allows the controller to measure the system response to determine effective settings for PID control. When autotuning is initiated the controller reverts to on-off control. The temperature must cross the Autotune Set Point four times to complete the autotuning process. Once complete, the controller controls at the normal set point, using the new parameters.

To initiate an autotune, go to **Device Configuration > Control Loops > Loop 1 or 2 > Loop Settings** and click the **Start Autotune** button. During an autotune, Control Loop Status indicates Autotuning. Once the autotune is complete, Control Loop Status reverts to its original status.



Inputs

INFOSENSE-P™ Temperature Sensing

Watlow's INFOSENSE-P™ feature can improve temperature sensing accuracy by 50%. Watlow's INFOSENSE-P™ thermocouples and RTD temperature sensors must be used together to achieve these results.

Each INFOSENSE-P™ plug and play "smart" sensor provides sensor characterization information to the Series PD. These values characterize Watlow sensors resulting in greater system accuracy.

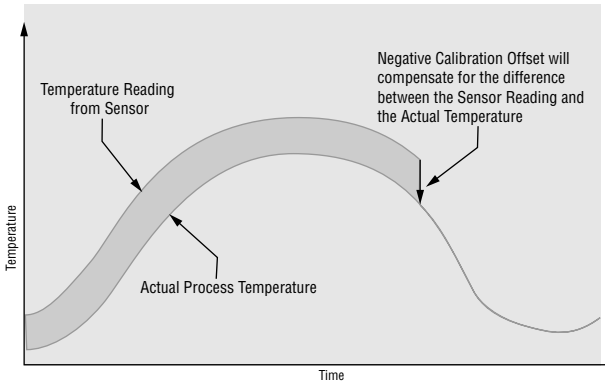
To set up an analog input to accept an INFOSENSE-P™ sensor, go to **Device Configuration > Inputs > Analog Input 1 or 2 > Analog Input Sensor Type** and select **InfoSense PnP**.

The Series PD reads the INFOSENSE-P™ sensor information upon power up and any time an input error occurs. Contact your Watlow salesperson or Watlow authorized distributor for the pricing and availability of Watlow INFOSENSE-P™ sensor products.

Calibration Offset

Calibration offset allows a device to compensate for an inaccurate sensor, lead resistance or other factors that affect the input value. A positive offset increases the input value, and a negative offset decreases the input value.

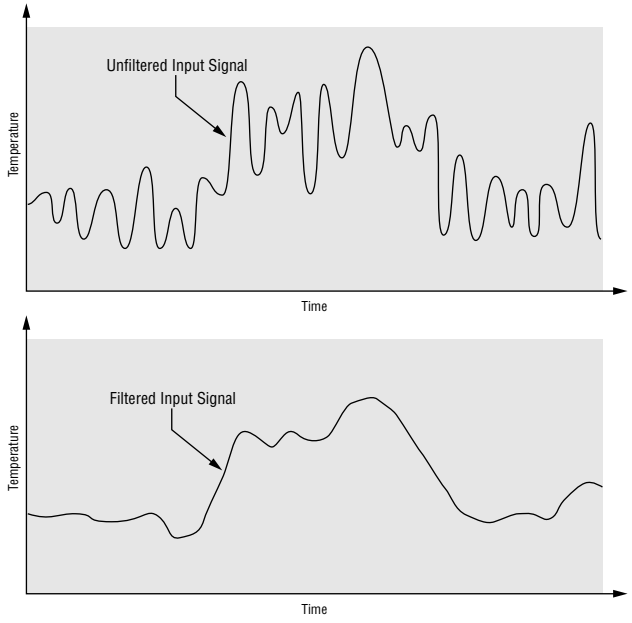
To view or change the input offset value, go to **Device Configuration > Inputs > Analog Input 1 or 2 > Single Offset Value**. Enter an offset value and click the Submit button to send the new values.



Filter Time Constant

Filtering smoothes an input signal by applying a first-order filter time constant to the signal. Filtering the input signal may improve the performance of PID control in a noisy or very dynamic system.

To view or change the filter time constant value, go to **Device Configuration > Inputs > Analog Input 1 or 2 > Input Filtering Filter Method** and select **First Order**. Enter a **Filter Time Base** value and click the Submit button to send the new value.



Sensor Selection

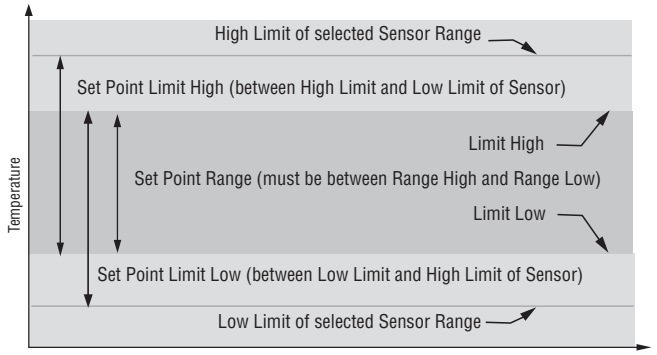
You need to configure the controller to match the input device, which is normally a thermocouple, RTD or process transmitter. When you select an input device, the controller automatically sets the input linearization to match the sensor. It also sets high and low limits, which in turn limit the set point range-high and range-low values.

To view or change the sensor type, go to **Device Configuration > Inputs > Analog Input 1 or 2 > Analog Input Sensor Type**. Select the correct sensor type. Depending on your sensor type, you must also set the T/C, RTD or Process Parameter values. Click the Submit button to send the new values.

Set Point Low Limit and High Limit

The controller constrains the set point to a value between a low limit and a high limit. The set point limits must fall between the sensor low and high range limits. Set point values outside of the set point limits are not valid.

To view or change the sensor type, go to **Device Configuration > Control Loops > Loop 1 or 2 > Loop Settings > Set Point Limit Low or Set Point Limit High**. Enter a value for Limit Low and Limit High. Click the Submit button to send the new values.


High Limit of selected Sensor Range
Set Point Limit High (between High Limit and Low Limit of Sensor)
Limit High
Set Point Range (must be between Range High and Range Low)
Limit Low
Set Point Limit Low (between Low Limit and High Limit of Sensor)
Low Limit of selected Sensor Range
Temperature

Voltage or Current Scaling

When an analog input is selected as process voltage or process current input, you must choose the value of voltage or current to be the low and high ends. For example, when using a 4 to 20 mA input, the scale low value would be 4.00 mA and the scale high value would be 20.00 mA. Commonly used scale ranges are: 0 to 20 mA, 4 to 20 mA, 0 to 5V, 1 to 5V and 0 to 10V.

The Series PD allows you to create a scale range for special applications other than the standard ones listed above. Reversing of the scales from high values to low values is permitted for analog input signals that have a reversed action. For example, 50 psi = 4 mA and 10 psi = 20 mA.

To view or change the input scale values, go to **Device Configuration > Inputs > Analog Input 1 or 2 > Process Parameters > Low Voltage Scale and High Voltage Scale** for voltage inputs, or **Low Current Scale and High Current Scale** for current inputs. Enter a value for Low Scale and High Scale. Click the Submit button to send the new values.

Low Process Scale and High Process Scale

With a process input, you must choose a value to represent the low and high ends of the current or voltage range. Choosing these values allows the controller's display to be scaled into the actual working units of measurement. For example, the analog input from a humidity transmitter could represent 0 to 100 percent relative humidity as a process signal of 4 to 20 mA. Low scale would be set to 0 to represent 4 mA and high scale set to 100 to represent 20 mA. The indication on the display would then represent percent humidity and range from 0 to 100 percent with an input of 4 to 20 mA.

To view or change the Low Process Scale or High Process Scale values, go to **Device Configuration > Inputs > Analog Input 1 or 2 > Process Parameters > Low Process Scale and High Process Scale**. Enter a value for Low Process Scale and High Process Scale. Click the Submit button to send the new values.

Load Current Monitoring

Inputs 3 and 4 can be ordered as current transformer (CT) inputs. These inputs can be assigned to monitor any control output, except process outputs, and trigger an alarm when the load current drops below the CT alarm set point value. This is ideal for detecting heater loss in applications with multiple heaters. For instance, if a system has five, 10 amp heaters, the CT input measures 50 amps regardless of the percent output power requested. Load current is only measured when the time proportioned output is on.

The standard Watlow CT is designed to measure up to 50 amps of current as it passes through the center of the CT. See Chapter 2 for wiring information. The CT provides an output of approximately 1 mA~(ac) per amp of ac current. The CT must be purchased separately.

To enable a CT input, go to **Device Configuration > Inputs > CT Input 3 or 4 > CT Input Function**, and select CT Input.

To configure the CT input, go to **Device Configuration > Inputs > CT Input 3 or 4 > Current Transformer Parameters.** Set the these parameters to match your application requirements.

To monitor load current, go to **Monitor Device > Input Status > Input 3 or 4 Value.**

To set the Current Transformer Alarm Set Point, go to **Device Configuration > Alarm 1, 2, 3, 4, 5, 6, 7** or **8 > Current Transformer Alarm Parameters > Alarm Set Point.** Enter the load current value that will trip the current transformer alarm.

There are limitations when using CT inputs:

- To obtain a valid load current reading, the output on-time must be a minimum of 0.4 seconds. To calculate output on-time, multiply the percent output times the cycle time setting. For example, with 30% output and a 2 second cycle time, the on-time would be 0.30 x 2 = 0.6 seconds. This on-time is greater than the 0.4 second minimum and would result in a valid load current reading. In this example, any output power levels below 20% output, would result in on-times that are less than 0.4 seconds. If the on-time is too short to allow a valid current reading, the last valid reading is used.
- CT inputs will only function with time proportioned outputs (output options C, E, K or J) and the output must be configured for fixed time base operation.
- CT inputs cannot be assigned to process outputs (output option F).

The CT input can accept up to 50mA~(ac) maximum. An interstage transformer may be used for larger loads. See Chapter 2.

Digital Inputs

Inputs 3 and 4 can be ordered as digital inputs. Digital inputs allow an operator to perform certain functions by opening or closing a switch or applying a dc logic signal to the Series PD. This feature can add convenience, safety or security to a system.

The digital inputs can be assigned to:

- Switch to another set point for Loop 1 or Loop 2
- Acknowledge latched alarms
- Switch to manual mode operation
- Switch a control loop off
- Pause datalogging.

All of these functions are level triggered except acknowledge latched alarms, which is edge triggered. For level triggered, a low or high state will trigger an event for as long as that state exists. For edge triggered, a rising or falling edge will trigger an event.

To enable a digital input, go to **Device Configuration > Inputs > Digital Input 3 or 4 > Function**, and select the the action to take based upon the digital input status.

To configure the CT input, go to **Device Configuration > Inputs > Digital Input 3 or 4.** Select configuration parameters to match your application requirements.

To monitor Digital Input Status, go to **Monitor Device > Input Status > Input 3 or 4 Value and Status.** This indicates if the event is active and what digital input function is selected.

Control Methods

Output Configuration

Each controller output can be assigned to a Control Loop and configured as a heat output, a cool output, an event/alarm output or off (disabled). No dependency limitations have been placed on the available combinations. The outputs can be configured in any combination. For instance, all outputs could be set to cool.

Analog outputs can be scaled for any desired current range between 0 and 20 mA or voltage range between 0 to 10V. The ranges can be reversed to high-to-low for reverse acting devices.

Heat and cool outputs use the Control Loop Set Point and Control Loop page parameters to determine the output value. All heat and cool outputs for each loop use the same set point value. Heat and cool each have their own set of control parameters. All heat outputs for each loop use the same set of heat control parameters and all cool outputs for each loop use the same set of cool output parameters.

Each alarm output has its own set of configuration parameters and set points. An event/alarm can be assigned to any active analog input, allowing independent operation.

Auto (closed loop) and Manual (open loop) Control

The Series PD has two basic modes of operation, auto mode and manual mode. Auto mode allows the controller to decide whether to perform closed loop control or to follow the settings of the Input Failure Parameter setting. The manual mode only allows open loop control. The Series PD controller is normally used in the auto mode. The manual mode is usually only used for specialty applications or for troubleshooting.

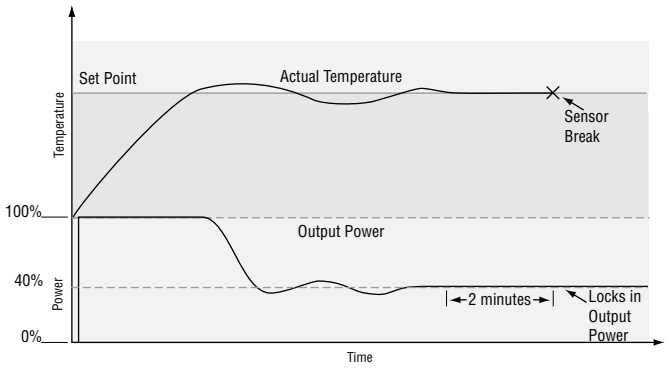
Manual mode is open loop control that allows the user to directly set the power level to the controller's output load. No adjustments of the output power level occur based on temperature or auto set point in this mode.

In auto mode, the controller monitors the input to determine if closed loop control is possible. The controller checks to make certain a functioning sensor is providing a valid input signal. If a valid input signal is present, the controller will perform closed loop control. Closed loop control uses a process sensor to determine the difference between the process value and the auto set point. Then the controller applies power to a control output load to reduce that difference.

If a valid input signal is not present, the controller will indicate an input status error at **Monitor Device > Input Status > Status**. The input number will also be highlighted with a red box.

To set the input error failure mode, go to **Device Configuration > Control Loops > Loop 1 or 2 > Loop Settings > Input Failure Parameters.** These settings determine controller operation in the event of a sensor failure. You can choose to have the controller perform a "bumpless" transfer, switch power to output a preset manual power level, or turn the output power off.

Bumpless transfer will allow the controller to transfer to the manual mode using the last power value calculated in the auto mode, if the process was stable at a ±5 percent output power level for two minutes prior to sensor failure, and the power level is less than 75 percent.



To determine the controller's response once a valid input signal returns to the controller, go to **Device Configuration > Control Loops > Loop 1 or 2 > Loop Settings > Input Failure Parameters > Failure Latching**. If you want any input errors to latch, set Failure Latching to On. With this setting the controller will continue to indicate an input error until the error is manually cleared. To clear a latched error, go to **Monitor Device > Process Value > Status** and click the Acknowledge button.

If Failure Latching is set to off, the controller will automatically clear the input error, change the Status back to No Fault and return to reading the temperature. If the controller was in the auto mode when the input error occurred, it will return to auto mode and resume closed loop control. If the controller was in manual mode when the error occurred, the controller will remain in open loop control.

To view or change the control mode of operation, go to **Monitor Device > Control Loop Status > Mode** and select Off (control loop outputs disabled), Manual (open loop) or Auto (closed loop).

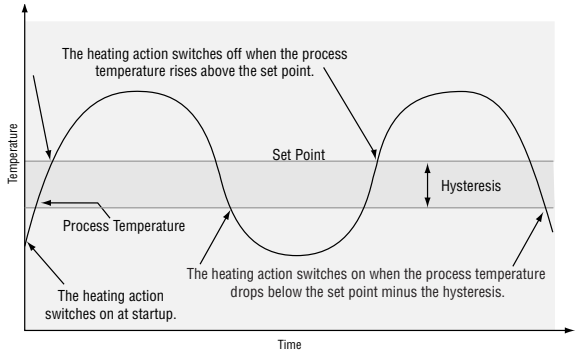
On-Off Control

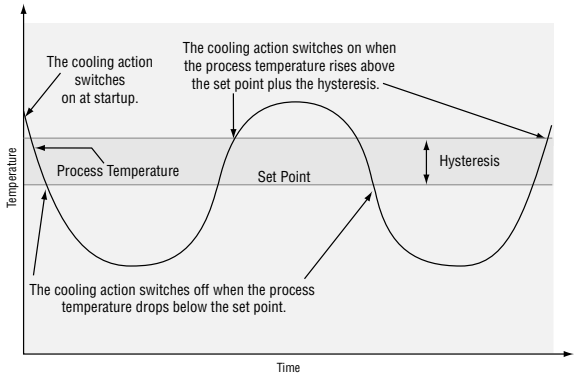
On-off control switches the output either full on or full off, depending on the input, auto set point and hysteresis values. The hysteresis value indicates the amount the process value must deviate from the set point to turn on the output. Increasing the value decreases the number of times the output will cycle. Decreasing hysteresis improves controllability. With hysteresis set to 1, the process value would stay closer to the auto set point, but the output would switch on and off more frequently, and may result in the output "chattering."

To select On-off control, go to **Device Configuration > Control Loops > Loop 1 or 2 > Loop Settings > Loop Heat Algorithm** or **Loop Cool Algorithm** and select On/Off.

To adjust the hysteresis, go to **Device Configuration > Control Loops > Loop 1 or 2 > Loop Settings > On/Off Parameters > Heat (Indirect)** or **Cool (Direct)**. Enter a value for hysteresis and click the Submit button to send the new value.

NOTE: Input Error Failure Parameters have no effect in on-off control mode. The control outputs go off.


The heating action switches off when the process temperature rises above the set point.
Temperature
Set Point
Hysteresis
Process Temperature
The heating action switches on when the process temperature drops below the set point minus the hysteresis.
The heating action switches on at startup.
Time

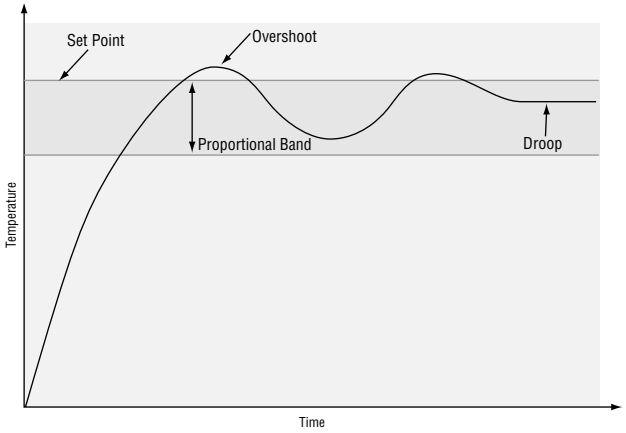

The cooling action switches on at startup.
The cooling action switches on when the process temperature rises above the set point plus the hysteresis.
Temperature
Process Temperature
Set Point
Hysteresis
The cooling action switches off when the process temperature drops below the set point.
Time

Proportional Control

Some processes need to maintain a temperature or process value closer to the set point than on-off control can provide. Proportional control provides closer control by adjusting the output when the temperature or process value is within a proportional band. When the value is in the band, the controller adjusts the output based on how close the process value is to the set point. The closer the process value is to the set point, the lower the output power. This is similar to backing off on the gas pedal of a car as you approach a stop sign. It keeps the temperature or process value from swinging as widely as it would with simple on-off control. However, when the system settles down, the temperature or process value tends to "droop" short of the set point.

With proportional control the output power level equals (set point minus process value) divided by the proportional band value.

To view or change the Proportional Band value, go to **Device Configuration > Control Loops > Loop 1 or 2 > Loop Settings > PID Parameters > PID Set #1 Prop Band Heat (Indirect)** or **PID Set #1 Prop Band Cool (Direct).** Enter a value for Proportional Band and click the Submit button to send the new value.



Proportional plus Integral (PI) Control

The droop caused by proportional control can be corrected by adding integral (reset) control. When the system settles down, the integral value is tuned to bring the temperature or process value closer to the set point. Integral determines the speed of the correction, but this may increase the overshoot at startup or when the set point is changed. Too much integral action will make the system unstable. Integral is cleared when the process value is outside of the proportional band.

Integral is measured in minutes per repeat. A low integral value causes a fast integrating action and a high integral value causes a slow integrating action. Integral is the inverse of reset.

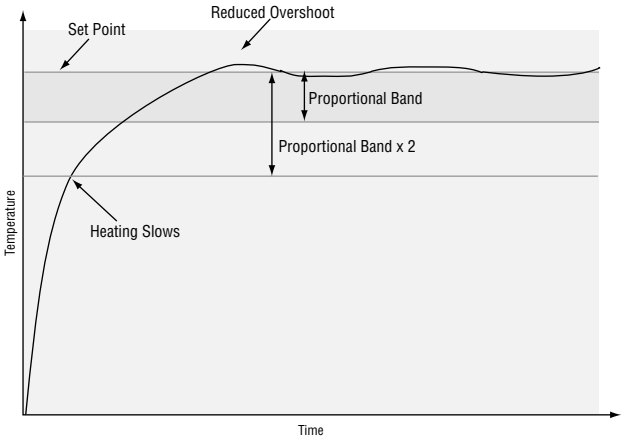
To view or change the Integral value, go to **Device Configuration > Control Loops > Loop 1 or 2 > Loop Settings > PID Parameters > PID Set #1 Integral Heat (Indirect)** or **PID Set #1 Integral Cool (Direct).** Enter a value for Integral and click the Submit button to send the new value.

Proportional plus Integral plus Derivative (PID) Control

Use derivative (rate) control to minimize the overshoot in a PI-controlled system. Derivative (rate) adjusts the output based on the rate of change in the temperature or process value. Too much derivative (rate) will make the system sluggish.

Rate action is active only when the process value is within twice the proportional value from the set point.

To view or change the Derivative value, go to **Device Configuration > Control Loops > Loop 1 or 2 > Loop Settings > PID Parameters > PID Set #1 Derivative Heat (Indirect)** or **PID Set #1 Derivative Cool (Direct).** Enter a value for Derivative and click the Submit button to send the new value.

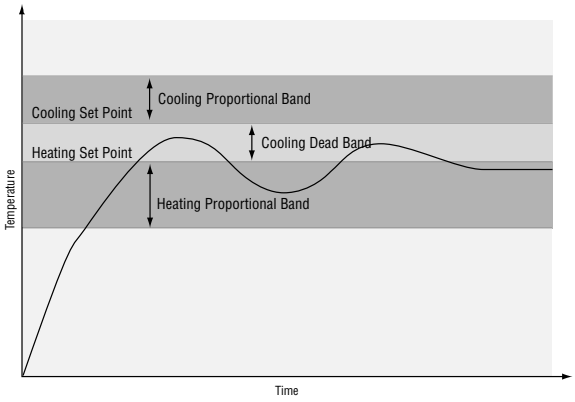


Dead Band

In heat/cool PID applications, a dead band above and below the set point can save energy and equipment wear by maintaining process temperature within acceptable ranges. Shifting the effective cooling set point and heating set point keeps the two systems from fighting each other.

Proportional action ceases when the process value is within the dead band. Integral action continues to bring the process temperature to the set point. When the dead band value is zero, the heating element activates when the temperature drops below the set point, and the cooling element switches on when the temperature exceeds the set point.

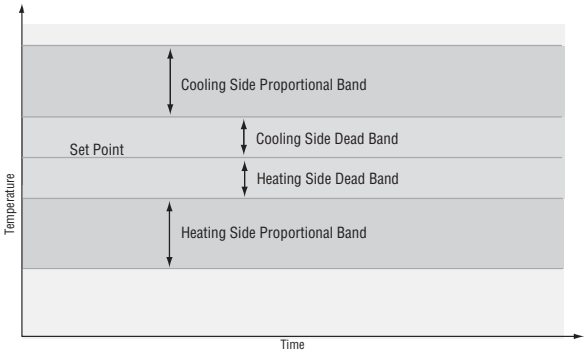
To view or change the Dead Band, go to **Device Configuration > Control Loops > Loop 1 or 2 > Loop Settings > PID Parameters > PID Set #1 Dead Band Heat (Indirect)** or **PID Set #1 Dead Band Cool (Direct).** Enter a value for Dead Band and click the Submit button to send the new value.



Independent Heat and Cool PID

In an application with one output assigned to heating and another assigned to cooling, each will have a separate set of PID parameters and separate dead bands. The heating parameters take effect when the process temperature is lower than the set point and the cooling parameters take effect when the process temperature is higher than the set point.

To view or change the PID Parameter values, go to **Device Configuration > Control Loops > Loop 1 or 2 > Loop Settings > PID Parameters.** Enter values for Proportional Band, Integral, Derivative and Dead Band and click the Submit button to send the new values.



Multiple PID Sets

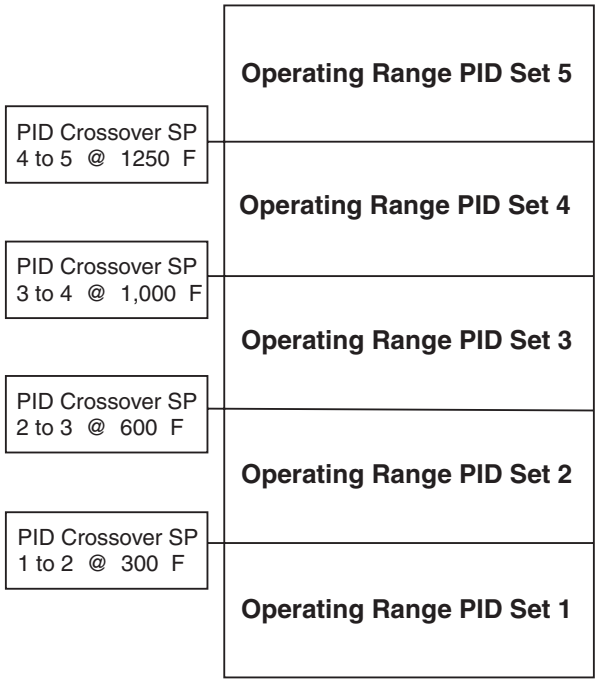
The Series PD supports up to five heat/cool PID sets. This feature is extremely valuable if the characteristics of your thermal system vary over its operating range. All PID sets can be auto tuned or manually tuned. The Series PD can be programmed to operate using any of the five PID sets based on crossover points of the set point or process value.

When the process or set point value crosses the crossover point, the PID set designated for that region of the operating range is used to control the percent power being supplied to the load.

There is a -1° hysteresis for each crossover. A rising temperature will change PID sets at the crossover value. A falling temperature will change PID sets at the crossover value -1°.

To view or change the the PID values or crossover set points, go to **Device Configuration > Control Loops > Loop 1 or 2 > Loop Settings > Multiple PID Sets > PID Set No. 1, 2, 3, 4 or 5.** Enter PID values and a crossover set point for each PID set and click the Submit button to send the new values.

Example:


Operating Range PID Set 5
PID Crossover SP
4 to 5 @ 1250 F
Operating Range PID Set 4
PID Crossover SP
3 to 4 @ 1,000 F
Operating Range PID Set 3
PID Crossover SP
2 to 3 @ 600 F
Operating Range PID Set 2
PID Crossover SP
1 to 2 @ 300 F
Operating Range PID Set 1

Alarms

Alarms are activated when the process value or temperature leaves a defined range. A user can configure how and when an alarm is triggered, what action it takes and whether it turns off automatically when the alarm condition is over.

To configure an output as an alarm output , go to **Device Configuration > Output 1, 2, 3 or 4 > Output Function** and select Event. Click the Submit button to send the new value.

Process Alarms

A process alarm uses an absolute set point to define the alarm condition. The alarm set point is independent from the auto set point.

To configure an event output as a process alarm, go to **Device Configuration > Alarm 1, 2, 3, 4, 5, 6, 7** or **8 > Alarm Type** and select Low Process or High Process. Click the Submit button to send the new value.

The high process alarm set point defines the process value or temperature that triggers a high side alarm. It must be between the low and high values of the sensor range.

The low process alarm set point defines the process or temperature that triggers a low side alarm. It must be between the low and high values of the sensor range.

To view or change a Process Alarm Set Point, go to **Monitor Device > Alarm Status > Alarm 1, 2, 3, 4, 5, 6, 7** or **8 Set Point.** Enter the Alarm Set Point value and click the Submit button to send the new value.

or

Go to **Device Configuration > Alarm 1, 2, 3, 4, 5, 6, 7** or **8 > Process Alarm Parameters.** Enter the Alarm Set Point value and click the Submit button to send the new value.

Deviation Alarms

The deviation alarm functions of the Series PD are a bit different from other Watlow controllers. These new functions, along with the ability to apply basic logic functions to the alarms, provide new alarm capabilities not available on previous products.

Deviation alarms use a set point that is defined relative to the auto set point. Low or high deviation alarm set points are calculated by adding or subtracting offset values from the auto set point. If the auto set point changes, the trip point defined by the deviation alarm set point automatically changes with it.

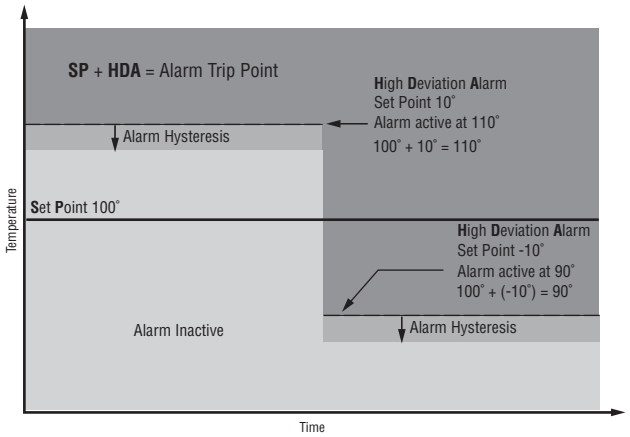
To configure an event output as a deviation alarm, go to **Device Configuration > Alarm 1, 2, 3, 4, 5, 6, 7** or **8 > Alarm Type** and select Low Deviation or High Deviation. Click the Submit button to send the new value.

The high deviation alarm set point defines the maximum deviation from the auto set point that triggers a high side alarm.

To calculate the high deviation alarm trip point:

Auto Set Point + High Deviation Alarm Set Point = High Deviation Alarm Trip Point.

A positive value results in a trip point above the auto set point and a negative value results in a trip point below the auto set point.

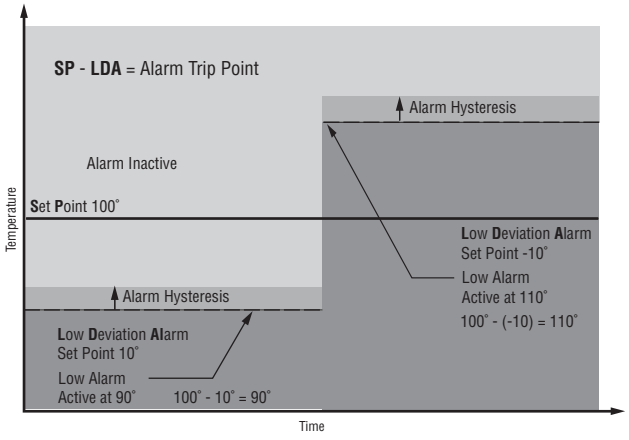


The low deviation alarm set point defines the maximum deviation from the auto set point that triggers a low side alarm.

To calculate the low deviation alarm trip point:

Auto Set Point - Low Deviation Alarm Set Point = Low Deviation Alarm Trip Point.

A positive value results in a trip point below the auto set point and a negative value results in a trip point above the auto set point.



To view or change a Deviation Alarm Set Point, go to **Monitor Device > Alarm Status > Alarm 1, 2, 3, 4, 5, 6, 7** or **8 Set Point.** Enter the Alarm Set Point value and click the Submit button to send the new value.

or

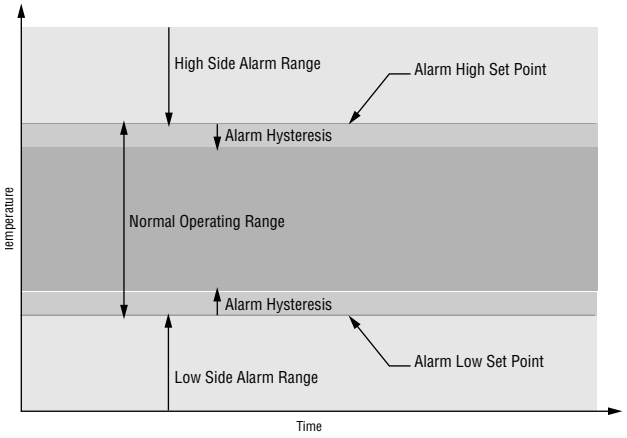
Go to **Device Configuration > Alarm 1, 2, 3, 4, 5, 6, 7** or **8 > Process Alarm Parameters.** Enter the Alarm Set Point value and click the Submit button to send the new value.

Alarm Hysteresis

An alarm state is triggered when the process value reaches the alarm high or alarm low set point. Alarm hysteresis defines how far the process must return into the normal operating range before the alarm can be cleared.

Alarm hysteresis is a zone inside each alarm set point. This zone is defined by adding the hysteresis value to the alarm low set point or subtracting the hysteresis value from the alarm high set point.

To view or change the Alarm Hysteresis, go to **Device Configuration > Alarm 1, 2, 3, 4, 5, 6, 7** or **8 > General Alarm Settings > Alarm Hysteresis.** Enter the Alarm Hysteresis value and click the Submit button to send the new value.

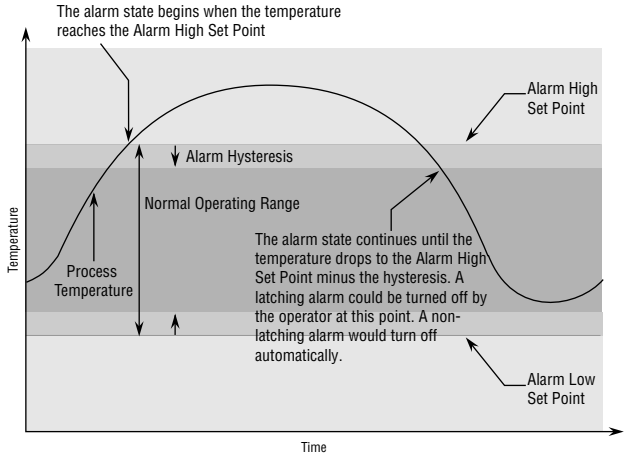


Alarm Latching

A latched alarm will remain active after the alarm condition has passed. It can only be deactivated by the user. An alarm that is not latched (self-clearing) will deactivate automatically when the alarm condition has passed.

To view or change Alarm Latching, go to **Device Configuration > Alarm 1, 2, 3, 4, 5, 6, 7** or **8 > General Alarm Settings > Latching.** To enable latching, select On and click the Submit button to send the new value.

To clear a Latched Alarm once the process has returned to a safe condition, go to **Monitor Device > Alarm Status > Alarm 1, 2, 3, 4, 5, 6, 7** or **8 > Latching.** Click the Acknowledge link to clear the latched alarm.

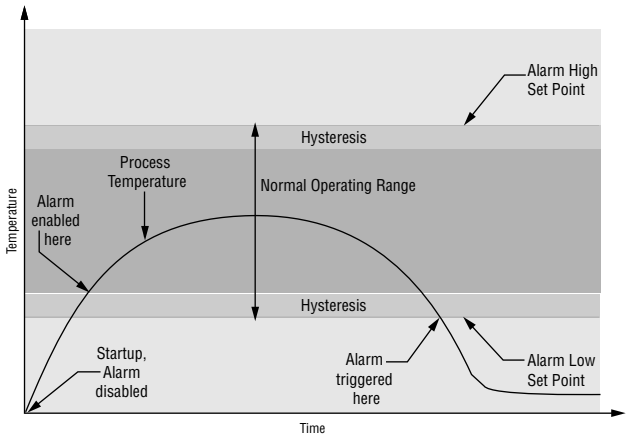

The alarm state begins when the temperature reaches the Alarm High Set Point
Alarm High Set Point
Alarm Hysteresis
Normal Operating Range
Process Temperature
The alarm state continues until the temperature drops to the Alarm High Set Point minus the hysteresis. A latching alarm could be turned off by the operator at this point. A non-latching alarm would turn off automatically.
Alarm Low Set Point
Temperature
Time

Alarm Blocking

Alarm blocking is often used to allow a system to warm up after it has been started up. With alarm blocking on, a low alarm is not triggered when the process temperature is initially lower than the alarm low set point. The process temperature has to enter the normal operating range beyond the hysteresis zone to activate the alarm function.

If the Series PD has an output that is functioning as a deviation alarm, the alarm is blocked when the set point is changed, until the process value re-enters the normal operating range.

To view or change Alarm Blocking, go to **Device Configuration > Alarm 1, 2, 3, 4, 5, 6, 7** or **8 > General Alarm Settings > Blocking.** To enable blocking, select On and click the Submit button to send the new value.



Alarm Silencing

Alarm sliencing allows the operator to disable the alarm output while the controller is in an alarm state. The process temperature has to enter the normal operating range beyond the hysteresis zone to activate the alarm output function.

When an alarm that has silencing enabled trips, go to **Monitor Device > Alarm Status > Alarm 1, 2, 3, 4, 5, 6, 7** or **8 > Silencing.** Click the Silence link to silence that alarm.

Network: Email

Electronic Notification

The Email Electronic Notification configuration allows the Series PD control to send emails or pages via Ethernet to 4 recipients for:

- Alarms that are configured to send the email
- Notification of datalog file problems if enabled

The configuration requires the name or IP address of your local SMTP (Simple Mail Transfer Protocol) server. Your local network support group will be able to supply you with this information.

SMTP Server IP Resolution

Get Server IP from Server Name

Using the Server name entered in the SMTP Server Name: field, the Series PD will attempt to resolve the server name through the DNS (Domain Name Server) to obtain the correct IP address. This type of IP resolution is useful in case the IP address of the SMTP server should ever change.

Fixed Server Address

The Series PD will use the IP address in the SMTP Fixed Server Address: field to send the email notification messages.

Source Email Address

This field must contain a valid email address to act as the source address or reply email address for the email system. The Series PD can only send email messages, not receive them.

Email Recipient 1, 2, 3 and 4

Enter valid email addresses that you want notified if an alarm occurs or there are datalog file problems.

Send Email

Once the entries are submitted, and the server name is resolved with the DNS, clicking the Static information - Click here to refresh page. button will show another button, Send Email. Click this button to send a test email to all valid email addresses entered.

Datalogging: Settings

The datalogging option allows the Series PD to record the selected control values to a text file that can be used as future reference data from the control. Each text file has a unique name that identifies the file start date and time. If the file is transferred to a TFTP (Trivial File Transfer Protocol) server, the unit name is also used to further identify the file.

The time used for the File names is generated from the internal Real Time Clock (RTC).

Datalogging

Enabled

Starts datalogging to the File System. Each time datalogging is disabled, then enabled and the Submit button is pressed, a new datalog file is created using the current configuration parameters that are configured on the Datalogging Settings page.

Disabled

Stops datalogging to the File System. Each time datalogging is disabled and the Submit button is pressed, the current datalog file is closed and all datalogging activity stops.

Parameters To Datalog

Select the parameters that you want to write to the data log files. The more parameters you select to log, the faster the log files will fill up. The Series PD model number and user configuration determines what parameters appear. Parameters available for logging at user defined intervals are:

- Process Value - PV1, PV2
- Working Set Point - SP1, SP2
- Loop Power - PL1, PL2
- Digital Input - DI3, DI4
- CT Input - CT3, CT4

Alarm 1-8 Status is not logged at user defined intervals like the parameters listed above. Alarms are logged as events when they occur.

For details on the log data format, go to File Manager section in Features Chapter.

Logging Parameters

Logging Interval

Determines the frequency that the logging system will record the Process Values, Working Setpoint, Loop Power or optional Discrete or Current Transformer input values. These fields allow entering the number of Seconds or Minutes.

A standard dual input Series PD logging both inputs, setpoints and loop power, will fill the file system (10 files, 190K per file) in less than 24 hours. Increasing the interval will allow the system to capture data for a longer period of time but may miss important data between data capture intervals.

Logging Data Compression

Yes

Enables Data Compression, which will not enter a value in the log text file for any data that is identical to the previous log data.

The File System has a fixed file size of approximately 190k bytes per file, and a maximum of 10 files. With data compression enabled, duplicate data is not written to the files allowing more data to be written into each file.

No

Disables Data Compression, which will enter a value in the log text file for all data points. This may be desirable when the text files are exported to a spreadsheet application like Microsoft Excel, to evaluate or manipulate the data.

When Log File is Full

Overwrite Oldest Data

The File System has a fixed file size of approximately 190k bytes per file, and a maximum of 10 files. Once the 10th file has been created and filled, the system will automatically delete the oldest log file. Log files that have not been backed up, using the TFTP server or saved manually, will be lost.

Stop Logging

When the File System storage is full, the logging will stop. If configured to send an email and the Network Email is properly configured, the Series PD will send an email indicating the File System is full.

To resume logging data, delete one or more files in the File System.

Write Log File To TFTP Server:

Yes

This option allows the Series PD to transfer completed data log files to a computer for long term storage.

The File System has a fixed file size of approximately 190k bytes per file, and a maximum of 10 files. As each file is completed, the system will automatically transfer the completed file to the TFTP Server computer.

No

The Series PD does not attempt to write log files to a TFTP server.

TFTP Server Configuration

There are a number of TFTP servers available on the web. Search the web on the keywords *TFTP server*.

- The TFTP server should preferably be located on the same subnet as the Series PD.
- The TFTP Server should also be configured to write all files to a predetermined folder.
- Some TFTP server configurations allow only a select range or specific IP addresses to access the server. This may be set to accept files from any number of Series PD. Each file will be uniquely identified by the Series PD name and file start date and time in this directory.

- It is advisable to configure the TFTP server to reject duplicate inbound files. When the Series PD is restarted, it will attempt to write all files in the file system to the TFTP server. There is no reason to backup the files that already exist on the TFTP server.
- The TFTP server does not need to be configured for output files.
- The TFTP server should be configured to start automatically any time the computer is rebooted.

TFTP Server IP Resolution

Get Server IP from Server Name

Using the Server name entered in the TFTP Server Name: field, the unit will attempt to resolve the server name through the DNS (Domain Name Server) to obtain the correct IP address. This form is useful in case the IP address of the TFTP server should ever change.

Fixed Server Address

The Series PD will use the IP address in the TFTP Fixed Server Address: field to locate the server.

Send Email On File Transfer Error

Yes

Enable the control to generate the following email message if a file transfer error occurs:

Device name: PD000311

The datalogging TFTP server IP was unable to be resolved or the file system is full.

This message is generated because:

1. The Series PD cannot transfer the files to the TFTP server for some reason.
2. The Series PD is configured to stop logging when the file system is full.

No

Disable sending an email for logging errors.

Delete All Datalog Files

This command button will delete all inactive log files. If logging is currently enabled the active log file will not be deleted from the File System.

Datalogging: Clock

The Clock time is generated by an internal Real Time Clock (RTC) and is used only for the optional datalogging capability.

The RTC does not support automatic Daylight Savings Time change over. This must be handled manually where required.

Clock Time:

Current Time

Allows entering the current Time using a 12 hour format, AM/PM

An additional text field is supplied that allows entering the local time zone format such as CDT for Central Daylight Time or PST for Pacific Standard Time. This field is written into each Log file to identify the time zone that the file was originated from.

NOTE: In order to maintain clock accuracy when changing parameters on the Clock page, make sure the last change is to update the clock. This will prevent inadvertently submitting a change with a time that is several seconds old.

Current Date

Allows entering the current Date as the Day, Month and Year.

Synchronization

Time Synchronization allows the real time clock to be synchronized with an external time server and recheck it every 15 minutes. This provides better than a 1 second accuracy for the log files.

Synchronize Clock With Time Server:

Yes

Enable the Series PD to synchronize with a time server.

No

Do not use time server synchronization.

Time Server IP Resolution:

Get Server from DHCP

Many network configurations support time servers to maintain the correct time for all computers on the network. This option allows the unit to read the time server IP address from the DHCP server. The Series PD may display the time in UTC (Universal Standard Time, or GMT).

Get Server IP from Server Name

Using the server name entered in the Time Server Name: field, the unit will attempt to resolve the server name through the DNS (Domain Name Server) to obtain the correct IP address. This is useful in case the IP address of the time server would ever change.

Fixed Server Address

The Series PD will use the IP address in the Time Fixed Server Address: field to locate the time server. The time server specified should be the same time zone as the Series PD

The last synchronization occurred at:

This field indicates the last time that the time synchronization with the time server occurred. This typically happen when the synchronization is first configured, when the Series PD is restarted or every 15 minutes.

Synchronization Notes:

- Many time servers are configured to pass the time as UTC (Universal Standard Time, or GMT). Most public time servers will generate the output in UTC format.
- You can install a time server locally on your network, configured to generate your own local time. This would be used specifically for maintaining time for your Series PD logging time synchronization.
- It may not be possible to link to a public time server if your network is protected by a firewall. You may need to use a time server on your local network.

File System: File Manager

The on-board storage is divided into two sections, Storage Device 0 and Storage Device 1.

Storage Device 0 contains only the data log files. The maximum log file size is approximately 190k bytes, with a 10 data log file maximum.

Files in Storage Device 0 can be backed up to another computer either by using the TFTP functionality or by right clicking each file manually and performing a Save As function to a remote computer directory.

Storage Device 1 can contain any type of file. The maximum file size is approximately 21k bytes each, with a 10 file maximum. For example, this storage section can be used to store operating instructions, cascade style sheets, custom logos, system diagrams, contact information, links to web sites, etc.

Storing HTML files with the extensions .html or .htm, will result in hot links appearing at the bottom of the Navigation frame on the left side of the browser window. Click on a hot link to open that file.

Log File Data

The first character of each line of data in the data log file identifies the line function.

Character	Description	Information
H	Header	Date, Time, Time Zone and Column. Entered at the start of the log file or whenever the Log Settings are changed.
V	Version	Log file version record entered only at the start of the log file.
U	Units	Identifies the configured input units (°F, °C, volts or current). Entered at the start of a log file or if the units are changed.
D	Data	Data is logged at the specified interval for the configured PV, SP, LP, DI or CT.
E	Error Records	Input Error state entered at the beginning of the log file or anytime an input error occurs or clears.
A	Alarm	Process Alarm, Deviation Alarm or Event. Alarm state is entered at the beginning of each log file and for any time an alarm occurs, is silenced, acknowledged or cleared.
P	Power	Power to the unit was reapplied. Entered only if power was applied with datalogging enabled.

Data Examples

Data can be logged up to once every second or any specified interval in seconds or minutes. Input Process Values, Working Setpoint, Loop Power, Optional Discrete Inputs or Current Transformer inputs are logged at the user defined logging intervals.

H,Sep 02 03,10:04:23 AM, PV1,PV2,SP1,SP2,PL1,PL2, DI3, CT4,

This header example, denoted by the letter H, consists of the Date, Time of Day, Process Variable for Input 1 and Input 2, Working Set Point for Loop 1 and 2, Power Level for Loop 1 and 2, Digital Input 3 Status and Current Transformer 4 Input Value.

D,,10:04:23 AM,22.040,4.050,10.000,0.000,0.00,-6.75,Inactive,20.34,

This header example, denoted by the letter D, consists of a blank space for the Date, data for the Time of Day, Process Variable for Input 1, Process Variable for Input 2, Working Set Point for Loop 1, Working Set Point for Loop 2, Power Level for Loop 1, Power Level for Loop 2, Digital Input 3 Status and Current Transformer 4 Input Value.

Commas separate each field of the Header and Data records. Information in the Header record corresponds to the value in the Data record.

Alarm States are logged as an event and are not subject to the Logging Interval setting. For example, if the Logging Interval is configured for 1 minute, and Alarm 1 goes active several seconds after the last logging interval, a log entry will indicate the event:

A,,10:05:01 AM,Low Process Alarm 1 Active: Set Point 10.000

If the alarm is cleared several seconds later, this event will also be logged:

A,,10:05:12 AM,Low Process Alarm 1 Inactive: Set Point 10.000

File System: Web View

The Web View page allows customization of the web page served by the Series PD. The web banner at the top of the web page, the logo and web page formatting attributes can be customized for each Series PD.

Logo

This allows changing the logo in the upper left corner of the banner which can contain your company logo, a picture (.jpg) or animation file (.gif) to identify the process or customize the appearance of the Series PD web page. The Storage Device 1 file size limits (approximately 21k per file) and the banner area limit the logo size.

The file used for the logo can be loaded into Storage Device 1 on the File Manager page or can be called from an external HTML reference location.

Cascade Style Sheet (CSS)

This allows customization of the Series PD web pages. The web page elements, fonts, colors and formatting can be changed by editing the cascade style sheet file. Most browsers support cascade style sheets

The contents of the default style sheet are as follows:

```
.Logo { float: left; }
.Banner { font: italic 46px Times; width: 100%; text-align: center; background-color: #FFFFCC; color: #6699CC;
border-bottom-width: 2;
border-bottom-style: solid;
border-bottom-color: #004488;
}
.NavigationBody { font: 18px Times; background-color: #FFFFCC; color: #004488; margin-left: 1%; margin-top: 1%; }
.DeviceDisclaimer { font: 12px Times; text-align: left }
.PageTitle { font: 30px Times; width: 100%; text-align: center; background-color: #004488; color: #6699CC; }
.PageBody { font: 18px Times; background-color: #FFFFFF; color: #004488; margin-left: 1%; margin-top: 1%; }
.MonitorHeader { font: 14px Times; width: 100%; text-align: left; background-color: #6699CC; color: #004488; }
.Alert { background-color: #FF0000 };
.NoAlert { };
.Warning { font: bold; color: #FF0000 };
A:link { text-decoration: underline; color: #004488; }
A:visited { text-decoration: underline; color: #004488; }
A:active { text-decoration: none; color: #6699cc; }
A:hover { text-decoration: underline; color: #FF0000; }
// The following is used for the explorer like navigation system
.mhead {
width: 100%;
margin: 0px;
padding: 1px;
display: block;
font-size: 100%;
font: 14px Times; background-color: #FFFFCC; color: #004488;
}
.submenu {
display: none;
margin-left: 5px;
padding: 1px;
line-height: 100%;
font: 16px Times; background-color: #FFFFCC; color: #004488;
```

font-style: oblique;

}

body { margin: 0; font-family: Times; }

b {font-weight: bold;}

p {font: 11px/18px Times; margin-top: 5px;}

Banner Caption

Allows customization of the banner line (10 characters maximum) for all HTML pages. The banner can provide a more intuitive identity for the control, such as Chamber 1.

Trend Information

The Trend Information page displays the Logging Data that is contained in Storage Device 0 on the File System page. Each file in Storage Device 0 can be read in and the data displayed to for the inputs, set points and loop power.

Scaling shown on the left side of the display graph for the inputs and set points used will be limited to the maximum value read from any of the log files. Loop power scaling is fixed at +100 to -100 as indicated along the right side of the display graph.

Communications

1. Choose a device to communicate with the controller.

The controller can communicate with devices, such as a computer running a software program, a PLC (Programmable Logic Controller) or an OIT (Operator Interface Terminal). Whichever device is chosen, it needs to be able to communicate using the Modbus TCP Protocol.

2. Select a software package for the computer.

Select the software package based on what is required for the application. For basic communications (such as reading the process value or setting the set point), use the browser interface. This is mainly used for configuration, diagnostics and basic communications.

When purchasing a third-party software package, be sure to look for a package that is Modbus TCP compatible or has Modbus TCP drivers. Most third-party packages require you to specify the Modbus registers of the controller to setup the package.

Another option is to custom-create a software package. Using the Modbus register and data information in this user's manual, a software package can be created and tailored to the desired application.

3. Configure the software's communications parameters.

A software package (be it software for a computer, a PLC or an OIT) will need to be configured, such as the TCP/IP address.

4. Start communications with the controller.

With the communications successfully verified, the software is now ready for use with the controller. The above guidelines are the general steps to establishing communications. Some applications may require other steps not mentioned, but would follow the same general process.

5. Programming and configuring the controllers.

When programming and configuring the controllers with a software program, a couple of things must be kept in mind. If the software allows changing Device Configuration parameters such as Input Type, other parameter values that are dependent on that setting may be automatically changed.

Also, some controllers require that any changes made by the software program to controller parameters that need to be retained in the controller memory must be saved in the non-volatile memory writes register. Any settings not saved to controller memory will be lost when the controller's power is turned off.

11 Troubleshooting

Indication	Probable Cause(s)	Corrective Action
Power LED not lit. Controller appears dead. No communications to PC.	• Power supply switch off. • Fuse blown. • Breaker tripped. • Safety interlock door switch activated. • Separate system limit control latched. • Wiring incorrect or open. • Power supply voltage incorrect. • Defective controller.	• Turn switch on. • Replace fuse (check cause of failure). • Reset breaker (check cause of failure). • Close door. • Reset limit controller. • Check wiring. • Verify input power • Repair or replace controller.
Ethernet Link LED not lit. No communications to PC.	• Incorrect cable. • Defective PC or switch/hub. • Defective controller.	• Replace cable - use straight cable for switch/hub, cross cable for direct connection to PC. • Replace Ethernet port on PC or switch/hub. • Repair or replace controller.
Ethernet Link Activity LED not lit. No communication to PC.	• Incorrect IP address assignment. • Incorrect PC set-up. • Defective controller.	• Assign same logical address. Fixed IP address may have been assigned. • Ensure Microsoft Client and Netbios is loaded. • Repair or replace controller.
Input Error LED lit. Sensor over range, under range message on PC.	• Open sensor. • Shorted sensor. • Process has exceeded operating range. • Incorrect sensor configuration. • Defective controller.	• Replace sensor. • Repair wiring or replace sensor. • Operate controller within sensor operation range. • Configure Analog Input to correct sensor type. • Repair or replace controller.
Ambient error message on PC.	• Temperature is less than 0°C (32°F) or greater than 65°C (149°F). • Controller calibration is incorrect or corrupt. • Defective controller.	• Regulate temperature in cabinet. • Recalibrate controller. • Repair or replace controller.
No Output from controller. Output always active. Output always inactive.	• Incorrect wiring. • DC voltage used with AC output. • External voltage is not supplied for appropriate outputs. • Wrong output choice. • Incorrect configuration. • Power limit is in effect or in open loop mode. • Defective controller.	• Correct wiring, see wiring section. • K output is for AC control, C & F output is for DC control. • Wire correct voltage to be controlled for appropriate output, see wiring section. • Replace controller with correct outputs. • Configure Control Loop, PID, and Output. • Adjust power limit or change to closed loop mode. • Repair or replace controller.

Indication	Probable Cause(s)	Corrective Action
Alarm will not activate or clear.	• Controller is in Error condition. • Alarm is in latched setting. • Alarm is silenced. • Incorrect configuration. • Incorrect wiring. • Wrong output type. • Defective controller.	• Determine cause of error and correct. • Wait for process to return to normal and acknowledge alarm. • Wait for process to return to normal and alarm will work correctly. • Configure Alarm, Alarm Set Point, Hysteresis, Silencing and Latching. • Correct wiring. • Replace controller with correct output type. • Repair or replace controller.
Controller's process value reading is decreasing as the actual process is increasing.	• Thermocouple is reversed wired. • Analog voltage or current input scaling is reversed.	• Check thermocouple wire for correct polarity. • Configure correct scaling on Input page.
Controller does not control close enough to set point.	• PID values incorrect. • Cycle times incorrect. • Heat or cooling capacity incorrectly sized for application. • Incorrect sensor placement. • Controller is in Manual mode (open loop). • Control loop action configured incorrect.	• Tune controller (Auto Tune or Manual Tune). • Set cycle time to match hardware on Control Loop . • Size energy sources to match load. • Place sensor in optimal location. • Change to Auto mode (closed loop) on Monitor page. • Configure Control Loop Action on Control Loop page.
Output cycles (turns on and off) too frequently.	• Wrong control mode. PID control selected instead of ON-OFF control. • The cycle time is set too short.	• Activate ON-OFF control on Output page. • Increase Output Cycle Time on Output page.
Cannot access Security, Monitor, Configuration or Calibration page.	• Password is enabled and incorrect password is supplied.	• Provide the correct user name and password.
Process value reads incorrectly	• Analog input is configured incorrectly. • Thermocouple sensor shorted. • Process sensor scaled incorrectly. • Calibration offset is incorrect. • Sensor is wired incorrectly. • Controller calibration is incorrect or corrupt. • Defective controller.	• Configure control for appropriate sensor input on Analog Input page. • Repair wiring or replace sensor. • Set scaling on Analog Input page. • Correctly set calibration offset. • Wire sensor per wiring section. • Recalibrate controller. • Repair or replace controller.

A Appendix

Specifications

(2414)

Controller

- Microprocessor based user-selectable control modes
- Single or dual channel universal inputs
- Current transformer inputs to monitor heater currents
- Digital inputs
- Up to four programmable outputs
- Update rates, inputs = 10Hz, outputs = 10Hz

Operator Interface

- Browser based HMI (human machine interface)

Standard Conditions For Specifications

- Ambient temperature 25°C (77°F) ±3°C, rated line voltage, 50 to 60Hz, 0 to 90% RH non-condensing, 15-minute warm-up

Universal Analog Input

- Sample rate: 10 Hz

Thermocouple

- Type J, K, T, N, E, C, (W5), D (W3), PTII (F), R, S, B thermocouple types.
- >20 MΩ input impedance
- Maximum 20 Ω source resistance

RTD

- 2- or 3-wire platinum, 100 Ω
- DIN curve (.00385 curve)
- 250 µA nominal RTD excitation current

Process

- Range selectable: 0 to 10V⎓ (dc), 0 to 20 mA. (Can reverse low and high values.)
- Voltage input impedance 20 kΩ
- Current input impedance 100 Ω
- Minimum current source resistance 1 MΩ
- Input resolution 25,000 bits (approximately) at full scale

Input Accuracy Span Ranges

Type J:	0	to	750°C	or	32	to	1,382°F
Type K:	-200	to	1,250°C	or	-328	to	2,282°F
Type T:	-200	to	350°C	or	-328	to	662°F
Type N:	0	to	1,250°C	or	32	to	2,282°F
Type E:	-200	to	800°C	or	-328	to	1,470°F
Type C (W5):	0	to	2,315°C	or	32	to	4,200°F
Type D (W3):	0	to	2,315°C	or	32	to	4,200°F
Type PTII (F):	0	to	1,393°C	or	32	to	2,540°F
Type R:	0	to	1,450°C	or	32	to	2,642°F
Type S:	0	to	1,450°C	or	32	to	2,642°F
Type B:	870	to	1,700°C	or	1,598	to	3,092°F
RTD (DIN):	-200	to	800°C	or	-328	to	1,472°F
Process:	-1,999	to	9,999 un				

Thermocouple Input

- Calibration accuracy and sensor conformity: ±0.1% of input span ±1°C at standard conditions
- Temperature stability: ±0.2 degree per degree change in ambient for J, K, T, N, E, PTII ±0.5% for C, D, R and S

RTD Input

- Calibration accuracy ±0.1% of input range ±1°C at standard conditions
- Temperature stability: ±0.05 degree per degree change in ambient

Process Input

- Voltage input ranges
  Accuracy ±10mV ±1 LSD at standard conditions
  Temperature stability ±100 ppm/°C maximum
- Milliamp input ranges
  Accuracy ±20µA ±1 LSD at standard conditions
  Temperature stability ±100 ppm/°C maximum

Digital Input

- Contact closure or voltage input
- Input impedance:10 kΩ
- Sample rate: 5 Hz
- Resistance/contact input
  Input high state >7 kΩ
  Input low state 0-2 kΩ
- Voltage input
  Input high state 2-36 Vdc⎓
  Input low state 0-1 Vdc⎓

Current Transformer Input

- Input range: 0-50 mA≂ (ac)
- Input impedance:100Ω
- Sample rate: 5 Hz

Allowable Operating Ranges

Type J:	-210	to	1,200°C	or	-346	to	2,192°F
Type K:	-270	to	1,372°C	or	-454	to	2,502°F
Type T:	-270	to	400°C	or	-454	to	752°F
Type N:	-270	to	1,300°C	or	-454	to	2,372°F
Type E:	-270	to	1000°C	or	-454	to	1,832°F
Type C:	0	to	2,315°C	or	32	to	4,200°F
Type D:	0	to	2,315°C	or	32	to	4,200°F
Type PTII (F):	-3	to	1,396°C	or	25	to	2,545°F
Type R:	-50	to	1,767°C	or	-58	to	3,214°F
Type S:	-50	to	1,767°C	or	-58	to	3,214°F
Type B:	0	to	1,820°C	or	32	to	3,308°F
DIN	-200	to	800°C	or	-328	to	1,472°F
Process	-1,999	to	9,999 u				

Output Types

Open Collector

- Maximum voltage: 42V⎓ (dc)
- Maximum current: 200 mA
- Class 2 power source required

Switched DC

- Supply voltage : 24V⎓ (dc) @ 30 mA
- Supply voltage maximum: 28V⎓ (dc) into an infinite load

Solid-state Relay

- Optically isolated
- Zero cross switched
- Without contact suppression
- Minimum load current: 500 µA rms
- 0.5A at 24 to 240V~ (ac), resistive
- 20 VA pilot duty, 120/240V~ (ac), inductive
- Maximum offstate leakage current: 10 µA rms
- Use RC suppression for inductive loads

Electromechanical Relay, Form A

- Minimum load current: 10 mA
- 2 A @ 240V~ (ac) or 30V⎓ (dc), resistive
- 125 VA pilot duty, 120/240V~ (ac), inductive
- Electrical life 100,000 cycles at rated current
- Use RC suppression for inductive loads

Electromechanical Relay, Form C

- Minimum load current: 10 mA
- 2 A @ 240V~ (ac) or 30V⎓ (dc), resistive
- 125 VA pilot duty, 120/240V~ (ac), inductive
- Electrical life 100,000 cycles at rated current
- Use RC suppression for inductive loads

Process (Control or Retransmit)

- Range selectable: 0 to 20 mA, 4 to 20 mA, 0 to 5V⎓ (dc), 1 to 5V⎓ (dc), 0 to 10V⎓ (dc) (Can reverse low and high values.)
- Reverse or direct acting
- 0 to 10V⎓ (dc) voltage output into 1,000 Ω minimum load resistance
- 0 to 20 mA current output into 800 Ω maximum load resistance
- Resolution:
  dc ranges: 2.5 mV nominal
  mA ranges: 5 µA nominal
- Calibration accuracy:
  dc ranges: ±15 mV
  mA ranges: ±30 µA
- Temperature stability: 100 ppm/°C

Communications

Ethernet

- Modbus TCP or web server
- Isolated
- Ethernet RJ 45 connector, 10 base T
- HTTP interface
- DHCP, Auto IP or fixed IP addressing

Agency Approvals

- UL®508 File #102269, C-UL® and CE. See Declaration of Conformity.
  UL® is a registered trademark of the Underwriter's Laboratories, Inc.
- Submitted to Canadian Standards Association for testing.

Terminals

- Touch-safe
- Compression: Will accept 0.2 to 4 mm² (22 to 12 AWG) wire
- Wire strip length: 6 mm (0.24 in)
- Torque terminal blocks to 0.9. Nm (8 in-lb)

Power

- 24V≂ (ac/dc) +10%; -15%; 50/60 Hz, ±5%
- Class 2 power source required.
- 14VA maximum power consumption
- Data retention upon power failure via nonvolatile memory

Operating Environment

- 0 to 65°C (32 to 149°F)
- 0 to 90% RH, non-condensing
- Storage temperature: -40 to 85°C (-40 to 185°F)

Dimensions

- Width x height x depth
  42 mm x 118 mm x 128 mm (1.64 in x 4.66 in x 5.06 in)
- DIN rail or chassis mount
  DIN rail spec DIN 50022, 35 mm x 7.5 mm (1.38 in x 0.30 in)

Note: These specifications are subject to change without prior notice.

Ordering Information (2415)

	P D — — A
Control Type	**S or D**
S	Single channel
D	Dual channel
Auxiliary Inputs	**1, 2 or 3**
1	Dual digital inputs
2	One CT input and one digital input
3	Dual CT inputs (dual channel only)
Output 1	**C, K, F or J**
C	Switched dc, open collector
K	SSR, Form A, 0.5 A
F	Universal process
J	Mechanical relay, Form A, 2 A
Output 2	**A, C, K or E**
A	None
C	Switched dc, open collector
K	SSR, Form A, 0.5 A
E	Mechanical relay, Form C, 2 A
Output 3	**A, C, K, F* or J**
A	None
C	Switched dc, open collector
K	SSR, Form A, 0.5 A
F	Universal process*
J	Mechanical relay, Form A, 2 A
Output 4	**A, C, K or E**
A	None
C	Switched dc, open collector
K	SSR, Form A, 0.5 A
E	Mechanical relay, Form C, 2 A
Datalogging	**0 or 1**
0	None
1	2 megabytes of on-board memory
Custom options	**AA or BB**
AA	Watlow logo
BB	No logo

*** Note: Available only if "F" output option is selected for Output 1.**

Accessories
120~(ac) input, 24⎓ (dc) output, Class 2 power supply — 0830-0474-0000
12 pin removable screw terminal connector — 0836-1279-0012
14 pin removable screw terminal connector — 0836-1280-0014

Declaration of Conformity

Series PD

Watlow Winona, Inc.
1241 Bundy Blvd.
Winona, MN 55987 USA

Declares that the following product:

Designation:	**Series PD**
Model Numbers:	PD (D or S) (0 to 9) – (C, F, J or K) (A, C, E or K) (A, C, F, J or K) (A, C, E or K) – (0 or 1) (any three letters or numbers)
Classification:	Temperature control, Installation Category II, Pollution degree 2
Rated Voltage:	24V≂ (ac or dc)
Rated Frequency:	50 or 60 Hz
Rated Power Consumption:	14VA maximum
Degree of Protection	IP20

Meets the essential requirements of the following European Union Directives by using the relevant standards shown below to indicate compliance.

89/336/EEC Electromagnetic Compatibility Directive

EN 61326: 1997 With A1, 1998, A2:2002:			**Electrical equipment for measurement, control and laboratory use – EMC requirements (Industrial Immunity, Class B Emissions).**
EN 61000-4-2:	1996	With A1, 1998:	Electrostatic Discharge Immunity
EN 61000-4-3:	1997:		Radiated Field Immunity
EN 61000-4-4:	1995:		Electrical Fast-Transient / Burst Immunity
EN 61000-4-5:	1995	With A1, 1996:	Surge Immunity
EN 61000-4-6:	1996:		Conducted Immunity
EN 61000-4-11:	1994:		Voltage Dips, Short Interruptions and Voltage Variations Immunity
EN 61000-3-2:	ED.2.	2000:	Harmonic Current Emissions
EN 61000-3-3:	1995	With A1:1998:	Voltage Fluctuations and Flicker

73/23/EEC Low-Voltage Directive

EN 61010-1:	**2001**	**Safety Requirements of electrical equipment for measurement, control and laboratory use. Part 1: General requirements**

Raymond D. Feller III	Winona, Minnesota, USA
Name of Authorized Representative	Place of Issue
General Manager	November 2003
Title of Authorized Representative	Date of Issue

Signature of Authorized Representative

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Rev. B **December 2006**

PD & EtherNet/IP

1.0 Introduction to EtherNet/IP

With the introduction of the first Programmable Logic Controllers (PLC's) in the early to mid 1970's it quickly became apparent that there was a need to communicate from one PLC to another, and then on a wider scale, from PLC to other computers within the company infrastructure. Some of those needs involved applications with interlinking processes, such as batch processes or assembly lines utilizing multiple controls where better synchronization and control was required.

As time evolved the scope of the requirements for industrial communications broadened and became better defined with specific needs being addressed as they related to industrial communications. Most notably, those requirements and specifications revolved around the collection of data, configuration of the control and controlled devices, and the control of the process. Over the years, there have been many industrial protocols developed, some being proprietary and some open where few if any met all three of these requirements. Today, with the introduction of EtherNet/**IP** (**I**ndustrial **P**rotocol) it can be said that a user can collect, configure, and control using one protocol. Ethernet/IP is a network communication standard capable of handling large amounts of data at speeds of 10 Mbps or 100 Mbps, and at up to 1500 bytes per packet. The specification uses an open protocol at the application layer.

EtherNet/IP makes use of the standard off-the-shelf Ethernet chip sets and the currently installed physical media (hardware connections) and incorporates what is known today as the Common Industrial Protocol (CIP); an open protocol at the application layer fully managed by Open DeviceNet Vendors Association (ODVA, http://www.odva.org). CIP is the critical component providing the ability to collect, configure, and control utilizing both implicit messaging (real-time I/O messaging), and explicit messaging (information/configuration messaging), with full support for peer-to-peer and multi-master configurations.

2.0 PD Connectivity over EtherNet/IP

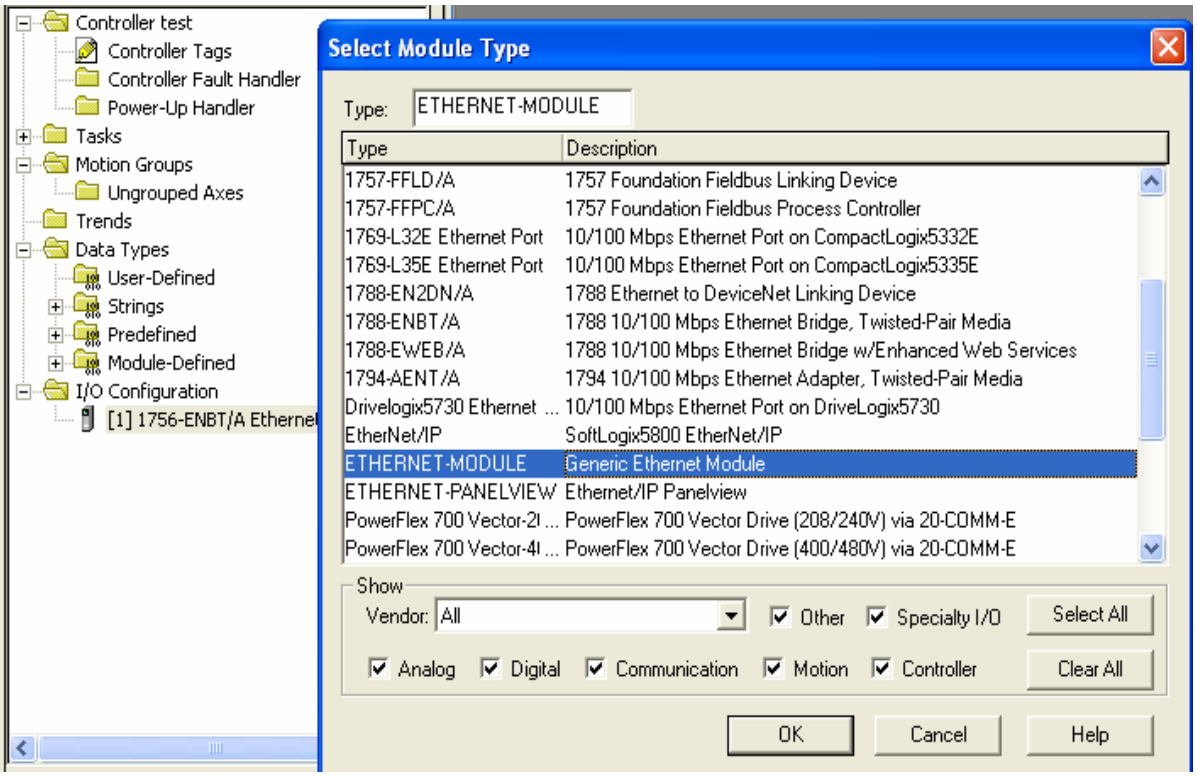
Prior to establishing communications with the PLC the PD must be connected into the network and either assume or be given an IP address. There are several ways that an IP address can be established, i.e., DHCP, Auto IP, or fixed IP address. For more detail on how to do this please refer to the section entitled "Network Services" found in Chapter 4 on page 21. Make note of the IP address once established for it will be needed when configuring the module.

2.1 I/O Configuration using an Allen-Bradley ControlLogix Processor

Depending on the controller used the actual setup steps defined below may vary. The specific control used in the examples given is a ControlLogix 1756-L1. Follow the steps below to add and configure the PD as a generic Ethernet module.

1. After configuring the 1756-ENBT/A EtherNet/IP scanner right click on it and add a new module.

Figure 2.1

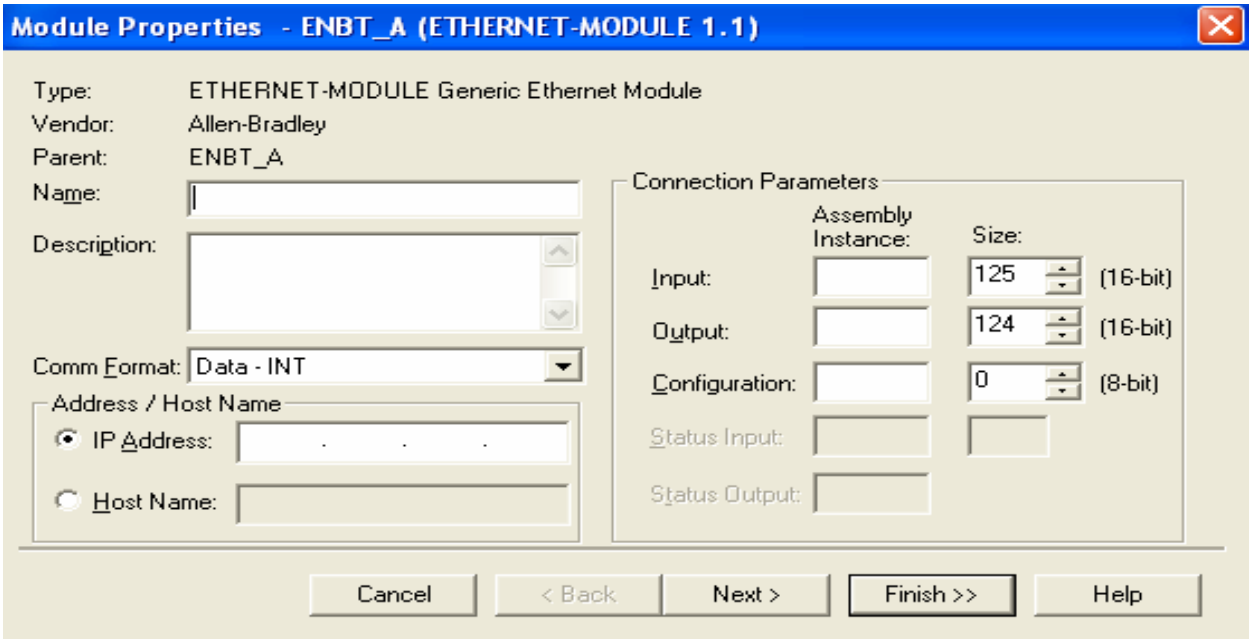


2. Select the “Generic Ethernet Module” and click OK

2.2 Configuring PD Properties using RSLogix 5000

After clicking OK above, the following screen will appear. Completion of all fields in this screen (the description field is an exception) is mandatory.

Figure 2.2



- **Name**
  This field, when entered will automatically be added as a controller tag and will be used in the program when referencing PD inputs or outputs.

- **Description**
  No entry required

- **Comm Format**
  As can be seen in the Static and Dynamic assemblies below, the PD data formats are dependent on the tag name being written to or read from. See data types below.

- **IP Address**
  Enter here, the previously acquired PD IP address.

- **Assembly Instance**
  - *Input, PD to ControlLogix*
    This field will identify either the Static 0x64 (100 decimal) or Dynamic 0x65 (101 decimal) input assembly **T**arget to **O**riginator (T → O)
  - *Output, ControlLogix to PD*
    This field will identify either the Static 0x70 (112 decimal) or Dynamic 0x71 (113 decimal) output assembly **O**riginator to **T**arget (O → T)
  - *Configuration*
    The PD does not use the configuration instance 0x80 (128 decimal) however it still needs to be entered here.

- **Assembly Size**
  The assembly size is dependent upon 2 factors:
  1. Comm Format, i.e., DINT or INT
  2. Size will vary depending on whether or not the Static or Dynamic Assembly is in use.
     - Static O → T max size = 10 words, Dynamic O → T max size = 30 words
     - Static T → O max size = 22 words, Dynamic T → O max size = 42 words

  The size for the configuration instance although not used, will always be stated as 0.

- **Data Types**
  As can be seen in the chart below, the data types used within the PD vary. Because there is no status returned from the PD in either the static or dynamic assembly it is suggested that the Comm Format be configured for DINT or INT.

BOOL	= Boolean
SINT	= 8-bit signed integer
INT	= 16-bit signed integer
DINT	= 32-bit signed integer
USINT	= 8-bit unsigned integer
UINT	= 16-bit unsigned integer
UDINT	= 32-bit unsigned integer
WORD	= 16-bit, bit string

2.2.1 T → O Static Assembly

Data Store Tag	Param Type	EIP Class	EIP Instance	EIP Attribute	EIP Data Type
tag_AI_ACTIVE_PROCESS_VALUE	Numeric	100	1	3	DINT
tag_AI_ACTIVE_PROCESS_VALUE	Numeric	100	1	8	DINT
tag_AI_ACTIVE_PROCESS_VALUE	Numeric	100	1	13	DINT
tag_AI_ACTIVE_PROCESS_VALUE	Numeric	100	1	18	DINT
tag_CLC_WORKING_SETPOINT	Numeric	100	1	33	DINT
tag_CLC_WORKING_SETPOINT	Numeric	100	1	41	DINT
tag_EIP_CL_POWER	Numeric	100	1	96	INT
tag_EIP_CL_POWER	Numeric	100	1	97	INT
tag_CL_METHOD	Enumerated	100	1	34	UINT
tag_CL_METHOD	Enumerated	100	1	42	UINT
tag_EIP_DIO_STATE	Numeric	100	1	95	WORD
tag_EIP_ALARM_STATUS	Numeric	100	1	98	WORD
tag_AI_ERROR	Enumerated	100	1	4	UINT
tag_AI_ERROR	Enumerated	100	1	9	UINT
tag_AI_ERROR	Enumerated	100	1	14	UINT
tag_AI_ERROR	Enumerated	100	1	19	UINT

***See Class, Instance, and Attribute Descriptions beginning on page 169 for enumerated values.**

If using the T → O Static Assembly (Input) the following sizes should be defined in RSLogix5000 for the following Comm Formats:
- DINT = 11
- INT = 22

2.2.2 T → O Dynamic Assembly

Data Store Tag	Param Type	EIP Class	EIP Instance	EIP Attribute	EIP - Data Type
tag_AI_ACTIVE_PROCESS_VALUE	Numeric	101	1	3	DINT
tag_AI_ACTIVE_PROCESS_VALUE	Numeric	101	1	8	DINT
tag_AI_ACTIVE_PROCESS_VALUE	Numeric	101	1	13	DINT
tag_AI_ACTIVE_PROCESS_VALUE	Numeric	101	1	18	DINT
tag_CLC_WORKING_SETPOINT	Numeric	101	1	33	DINT
tag_CLC_WORKING_SETPOINT	Numeric	101	1	41	DINT
tag_EIP_CL_POWER	Numeric	101	1	96	INT
tag_EIP_CL_POWER	Numeric	101	1	97	INT
tag_CL_METHOD	Enumerated	101	1	34	UINT
tag_CL_METHOD	Enumerated	101	1	42	UINT
tag_ EIP_DIO_STATE	Numeric	101	1	95	WORD
tag_EIP_ALARM_STATUS	Numeric	101	1	98	WORD
tag_AI_ERROR	Enumerated	101	1	4	UINT
tag_AI_ERROR	Enumerated	101	1	9	UINT
tag_AI_ERROR	Enumerated	101	1	14	UINT
tag_AI_ERROR	Enumerated	101	1	19	UINT

tag_EIP_T2O_DYNAMIC_ASSEMBLY_POINT	Numeric	109	1	1	STRUCT OF 8-BIT CIA
tag_EIP_T2O_DYNAMIC_ASSEMBLY_POINT	Numeric	109	2	1	STRUCT OF 8-BIT CIA
tag_EIP_T2O_DYNAMIC_ASSEMBLY_POINT	Numeric	109	3	1	STRUCT OF 8-BIT CIA
tag_EIP_T2O_DYNAMIC_ASSEMBLY_POINT	Numeric	109	4	1	STRUCT OF 8-BIT CIA
tag_EIP_T2O_DYNAMIC_ASSEMBLY_POINT	Numeric	109	5	1	STRUCT OF 8-BIT CIA
tag_EIP_T2O_DYNAMIC_ASSEMBLY_POINT	Numeric	109	6	1	STRUCT OF 8-BIT CIA
tag_EIP_T2O_DYNAMIC_ASSEMBLY_POINT	Numeric	109	7	1	STRUCT OF 8-BIT CIA
tag_EIP_T2O_DYNAMIC_ASSEMBLY_POINT	Numeric	109	8	1	STRUCT OF 8-BIT CIA
tag_EIP_T2O_DYNAMIC_ASSEMBLY_POINT	Numeric	109	9	1	STRUCT OF 8-BIT CIA
tag_EIP_T2O_DYNAMIC_ASSEMBLY_POINT	Numeric	109	10	1	STRUCT OF 8-BIT CIA

When using the T → O Dynamic Assembly (Input) the size would be determined by the tag name being retrieved. As an example, because the Loop 1 Alarm Setpoint (formatted as a DINT) is not read in the Static Assembly it may be desired to read this tag via the Dynamic Assembly. The input assembly size would change accordingly for the given formats:

- DINT = 12
- INT = 24

2.2.3 O → T Static Assembly

Data Store Tag	Instance	Param Type	EIP Class	EIP Instance	EIP Attribute	EIP Data Type
tag_CLC_SETPOINT	1	Numeric	112	1	32	DINT
tag_CLC_SETPOINT	2	Numeric	112	1	40	DINT
tag_OLC_SETPOINT	1	Numeric	112	1	31	INT
tag_OLC_SETPOINT	2	Numeric	112	1	39	INT
tag_CL_METHOD	1	Enumerated	112	1	34	UINT
tag_CL_METHOD	2	Enumerated	112	1	42	UINT
tag_EIP_AI_ERROR_ACK	1	Numeric	112	1	99	WORD
tag_EIP_ALARM_ACTIONS	1	Numeric	112	1	100	WORD

***See Class, Instance, and Attribute Descriptions beginning on page 169 for enumerated values.**

If using the O → T Static Assembly (Output) the following sizes should be defined in RSLogix5000 for the following Comm Formats:

- DINT = 5
- INT = 10

2.2.4 O → T Dynamic Assembly

Data Store Tag	Instance	Param Type	EIP Class	EIP Instance	EIP Attribute	EIP Data Type
tag_CLC_SETPOINT	1	Numeric	113	1	32	DINT
tag_CLC_SETPOINT	2	Numeric	113	1	40	DINT
tag_OLC_SETPOINT	1	Numeric	113	1	31	INT
tag_OLC_SETPOINT	2	Numeric	113	1	39	INT
tag_CL_METHOD	1	Enumerated	113	1	34	UINT

tag_CL_METHOD	2	Enumerated	113	1	42	UINT
tag_EIP_AI_ERROR_ACK	1	Numeric	113	1	99	WORD
tag_EIP_ALARM_ACTIONS	1	Numeric	113	1	100	WORD
tag_EIP_O2T_DYNAMIC_ASSEMBLY_POINT	1	Numeric	110	1	1	STRUCT OF 8-BIT CIA
tag_EIP_O2T_DYNAMIC_ASSEMBLY_POINT	2	Numeric	110	2	1	STRUCT OF 8-BIT CIA
tag_EIP_O2T_DYNAMIC_ASSEMBLY_POINT	3	Numeric	110	3	1	STRUCT OF 8-BIT CIA
tag_EIP_O2T_DYNAMIC_ASSEMBLY_POINT	4	Numeric	110	4	1	STRUCT OF 8-BIT CIA
tag_EIP_O2T_DYNAMIC_ASSEMBLY_POINT	5	Numeric	110	5	1	STRUCT OF 8-BIT CIA
tag_EIP_O2T_DYNAMIC_ASSEMBLY_POINT	6	Numeric	110	6	1	STRUCT OF 8-BIT CIA
tag_EIP_O2T_DYNAMIC_ASSEMBLY_POINT	7	Numeric	110	7	1	STRUCT OF 8-BIT CIA
tag_EIP_O2T_DYNAMIC_ASSEMBLY_POINT	8	Numeric	110	8	1	STRUCT OF 8-BIT CIA
tag_EIP_O2T_DYNAMIC_ASSEMBLY_POINT	9	Numeric	110	9	1	STRUCT OF 8-BIT CIA
tag_EIP_O2T_DYNAMIC_ASSEMBLY_POINT	10	Numeric	110	10	1	STRUCT OF 8-BIT CIA

When using the O → T Dynamic Assembly (Output) the size would be determined by the tag name being written to. As an example, because the Closed Loop Tuning Action (formatted as a UINT) is not being written to via the Static Assembly it may be desired to be able to change to Autotune via the control program using the Dynamic Assembly. The output assembly size would change accordingly for the given formats:

- DINT = 6
- INT = 11

2.2.5 EtherNet/IP Indicator Lights

The PD comes equipped with two new LED's. The LED characteristics are defined by Open DeviceNet Vendors Association (ODVA).

Figure 2.2.5a

Module Status Indicator

Indicator State	Summary	Requirement
Steady Off	No power	If no power is supplied to the device, the module status indicator shall be steady off.

Steady Green	Device operational	If the device is operating correctly, the module status indicator shall be steady green.
Flashing Green	Standby	If the device has not been configured, the module status indicator shall be flashing green.
Flashing Red	Minor fault	If the device has detected a recoverable minor fault, the module status indicator shall be flashing red. **NOTE**: An incorrect or inconsistent configuration would be considered a minor fault.
Steady Red	Major fault	If the device has detected a non-recoverable major fault, the module status indicator shall be steady red.
Flashing Green / Red	Self-test	While the device is performing its power up testing, the module status indicator shall be flashing green / red.

Figure 2.2.5b

Network Status Indicators

Steady Off	Not powered, no IP address	If the device does not have an IP address (or is powered off), the network status indicator shall be steady off.
Flashing Green	No connections	If the device has no established connections, but has obtained an IP address, the network status indicator shall be flashing green.
Steady Green	Connected	If the device has at least one established connection (even to the Message Router), the network status indicator shall be steady green.
Flashing Red	Connection timeout	If one or more of the connections in which this device is the target has timed out, the network status indicator shall be flashing red. This shall be left only if all timed out connections are reestablished or if the device is reset.
Steady Red	Duplicate IP	If the device has detected that its IP address is already in use, the network status indicator shall be steady red.
Flashing Green / Red	Self-test	While the device is performing its power up testing, the network status indicator shall be flashing green / red.

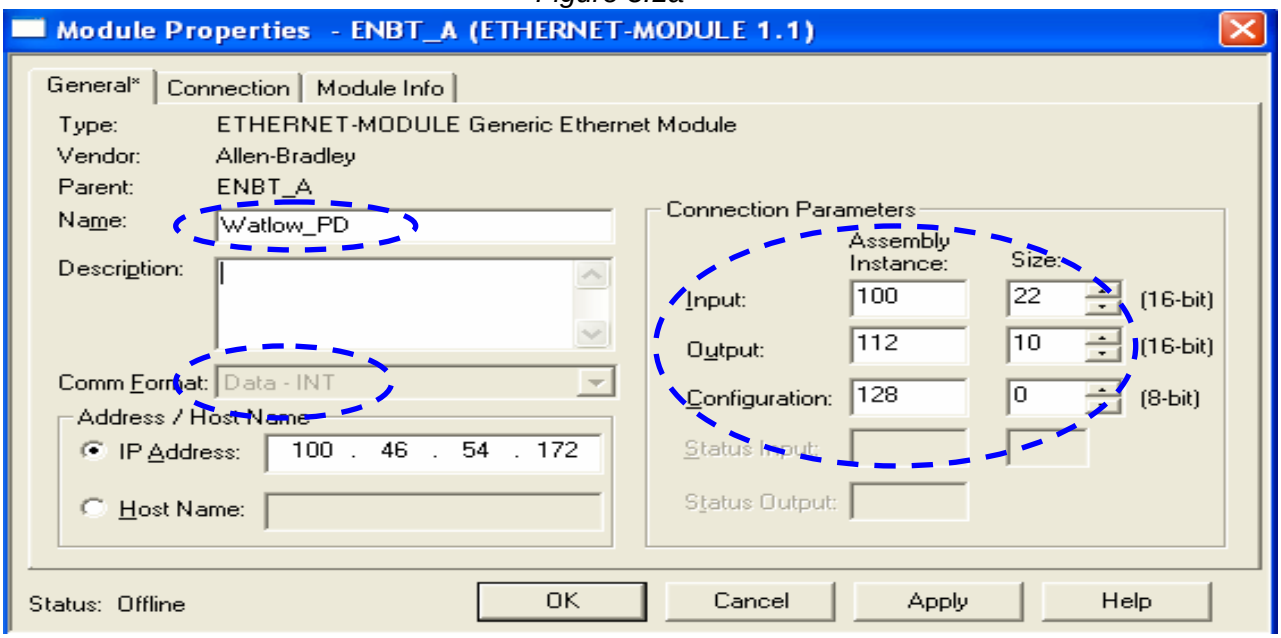
3.0 Communications between ControlLogix & PD

After configuration of the PD both real-time I/O connections (implicit messaging) and non-time critical (explicit messaging) communications are enabled. All information transferred between the control and the PD will be achieved through either the Static or Dynamic assemblies described above. All implicit messages are sent and received cyclically at the rate of the Requested Packet Interval (RPI) where explicit messages are typically initiated via a message instruction in the control program. Generally speaking, explicit messages are used as a tool for configuration. As an example, to change the size of the PD assembly from the standard static assembly to the dynamic assembly one would use a message instruction to accomplish this.

3.1 Ladder Logic Examples

In the ladder logic examples that will follow it would be good to note how the PD and its associated tags were configured. First, let's take a look at the tags that were created for the PD upon completion of the module configuration. Bringing the focus to the screen shot below, notice that the PD was given the name "Watlow_PD", the Comm Format was set at INT, and the Static Assemblies are being used for both the input and output assemblies.

Figure 3.1a



Upon completion of the PD configuration the Controller Tags are automatically generated for all assemblies as can be seen in the resultant screen shot below.

Figure 3.1b

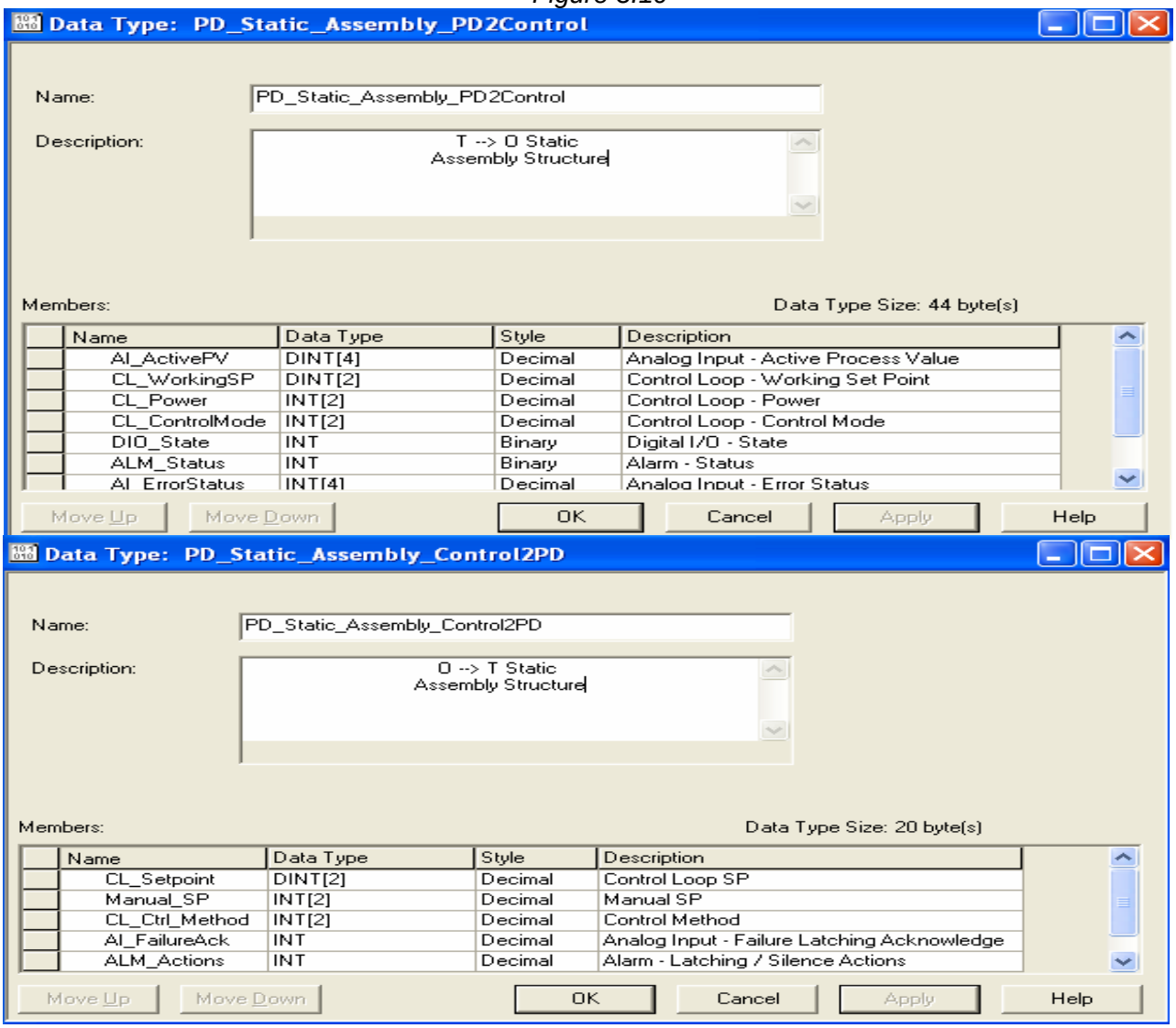
⊟ Watlow_PD:C		AB:ETHERNET_...	
⊞ Watlow_PD:C.Data		SINT[400]	Hex
⊟ Watlow_PD:I		AB:ETHERNET_...	
⊞ Watlow_PD:I.Data		INT[22]	Decimal
⊟ Watlow_PD:O		AB:ETHERNET_...	
⊞ Watlow_PD:O.Data		INT[10]	Decimal

Although the size for the Configuration Assembly was set to zero and is not used the system automatically assigns 400 signed integer bytes for the configuration. The PD inputs and outputs were sized correctly at 22 INT's and 10 INT's respectively. It will be these tags that will ultimately be used to read from and write to the PD.

As we have already learned, the data format within the PD varies depending on the specific tags needing to be used. This can be seen clearly in the tables found in sections 2.2.1 through 2.2.4. Note also, that the Comm Format applied to the module above (figure 3.1) applies to all assemblies regardless of their native format. With this in mind, the programming examples below were created with the desire to simplify the transfer of data to and from the controller to the various PD assemblies. To

accomplish this, user defined data types were created for the purpose of reflecting the O → T and the T → O assembly structures. In comparing the structure of the screen shot below with the tables found in sections 2.2.1 and 2.2.3 you will see a close resemblance. In taking a closer look, you will see that each of the members in both data types T → O and the O → T, correspond directly to the above mentioned tables.

Figure 3.1c


Data Type: PD_Static_Assembly_PD2Control
Name:
PD_Static_Assembly_PD2Control
Description:
T --> O Static
Assembly Structure
Members:
Data Type Size: 44 byte(s)
Name | Data Type | Style | Description
AI_ActivePV | DINT[4] | Decimal | Analog Input - Active Process Value
CL_WorkingSP | DINT[2] | Decimal | Control Loop - Working Set Point
CL_Power | INT[2] | Decimal | Control Loop - Power
CL_ControlMode | INT[2] | Decimal | Control Loop - Control Mode
DIO_State | INT | Binary | Digital I/O - State
ALM_Status | INT | Binary | Alarm - Status
AI_ErrorStatus | INT[4] | Decimal | Analog Input - Error Status
Move Up
Move Down
OK
Cancel
Apply
Help
Data Type: PD_Static_Assembly_Control2PD
Name:
PD_Static_Assembly_Control2PD
Description:
O --> T Static
Assembly Structure
Members:
Data Type Size: 20 byte(s)
Name | Data Type | Style | Description
CL_Setpoint | DINT[2] | Decimal | Control Loop SP
Manual_SP | INT[2] | Decimal | Manual SP
CL_Ctrl_Method | INT[2] | Decimal | Control Method
AI_FailureAck | INT | Decimal | Analog Input - Failure Latching Acknowledge
ALM_Actions | INT | Decimal | Alarm - Latching / Silence Actions
Move Up
Move Down
OK
Cancel
Apply
Help

Being able to create these user defined data types allows for a much less complex program, making it easier for all to understand. The last step prior to getting to the programming is to create a tag or tags that will use these data types. There will be one tag created for the PD inputs and another for the PD outputs. The two files that were created to use these data types were named PD_O2T (ControlLogix to PD) and PD_T2O (PD to ControlLogix). In defining and then using these data types in the

Program, simple instructions (i.e., COP) can be used to transfer all assembly information between ControlLogix processor and the PD. Because the data type "PD_Static_Assembly_Control2PD" matches up byte for byte with the system generated tag "Watlow_PD:0", and the fact that the copy (COP) instruction within the ControlLogix does a byte for byte transfer the programmer does not need to do any format conversions.

Figure 3.1d

⊟ PD_O2T	PD_Static_Assembly_Control2PD
⊞ PD_O2T.CL_Setpoint	DINT[2]
⊞ PD_O2T.Manual_SP	INT[2]
⊞ PD_O2T.CL_Ctrl_Method	INT[2]
⊞ PD_O2T.AI_FailureAck	INT
⊞ PD_O2T.ALM_Actions	INT
⊟ PD_T2O	PD_Static_Assembly_PD2Control
⊞ PD_T2O.AI_ActivePV	DINT[4]
⊞ PD_T2O.CL_WorkingSP	DINT[2]
⊞ PD_T2O.CL_Power	INT[2]
⊞ PD_T2O.CL_ControlMode	INT[2]
⊞ PD_T2O.DIO_State	INT
⊞ PD_T2O.ALM_Status	INT
⊞ PD_T2O.AI_ErrorStatus	INT[4]

3.1.1 Implicit Ladder Logic Examples

I/O connections provide dedicated, special purpose communication paths between a producing application and one or more consuming applications. Application-specific I/O data moves through these ports and is often referred to as implicit messaging. As this relates to the PD, the Static Assembly (see sections 2.2.1 and 2.2.3 above) is used to send and receive this I/O data. In the event that the user would want to read or write to different attributes, the Dynamic Assembly is provided to allow the user to increase the assembly size including those attributes of their choice.

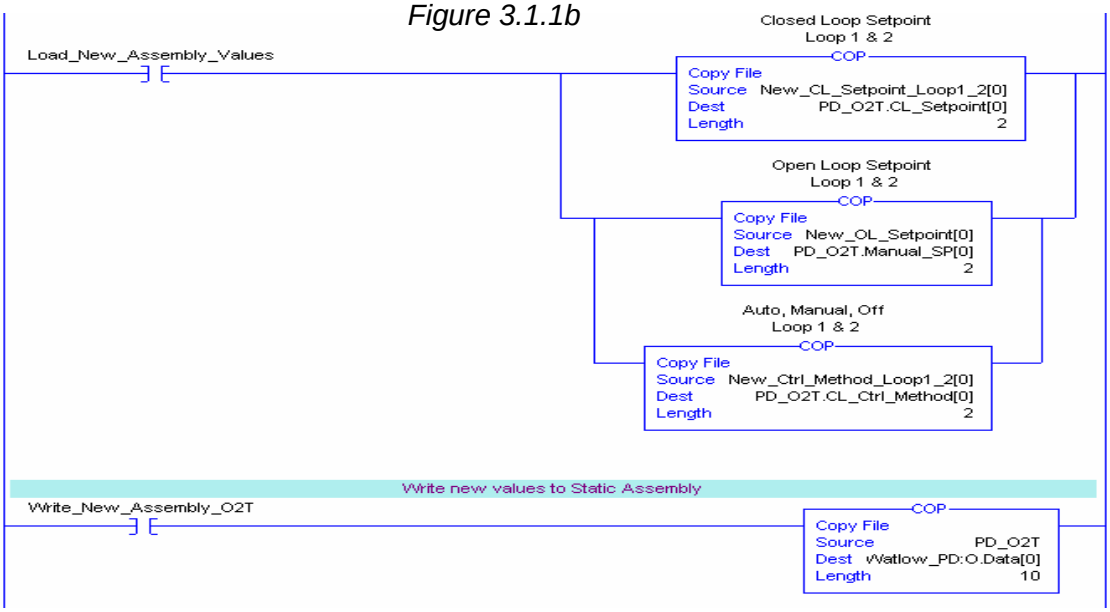
To better understand the ladder logic example below some of the tags used are defined below:

Figure 3.1.1a

⊟ New_CL_Setpoint_Loop1_2	DINT[2]
⊞ New_CL_Setpoint_Loop1_2[0]	DINT
⊞ New_CL_Setpoint_Loop1_2[1]	DINT
⊟ New_Ctrl_Method_Loop1_2	INT[2]
⊞ New_Ctrl_Method_Loop1_2[0]	INT
⊞ New_Ctrl_Method_Loop1_2[1]	INT
⊟ New_OL_Setpoint	INT[2]
⊞ New_OL_Setpoint[0]	INT
⊞ New_OL_Setpoint[1]	INT

Below, the first rung of logic simply takes the new values entered into the tags above and copies them to the appropriate tags in the array defined as PD_O2T. As can be seen in figure 3.1.1a the source tags were formatted to correspond with the format of the destination tags in the copy instructions.

Figure 3.1.1b



Once the contact labeled "Load_New_Assembly_Values" is actuated the new values will be loaded and ready to be transferred to the PD. The second rung, when "Write_New_Assembly_O2T" is actuated will do a byte for byte transfer of the source tags (ControlLogix) to the destination tags (PD).

In sections 2.2.1 and 2.2.2 above, words 17 and 18 of the input assembly are defined as DIO_STATE and ALARM_STATUS respectively. The definition of the bits within those words follows:

Input Assembly Word 17 "EIP_DIO_STATE"

Bit 00: tag_DI_STATE Instance 1 Bit 01: tag_DI_STATE Instance 2 Bit 08: tag DO STATE Instance 1	Bit 09: tag_DO_STATE Instance 2 Bit 10: tag_DO_STATE Instance 3 Bit 11: tag DO STATE Instance 4

Bits 02 – 07 & Bits 12- 15: Reserved

Input Assembly Word 18 "EIP_ALARM_STATUS"

Bit 00: 0 = Alarm #1 Inactive, 1 = Alarm #1 Active (tag_ALARM_STATUS Instance 1)
Bit 01: 0 = Alarm #2 Inactive, 1 = Alarm #2 Active (tag_ALARM_STATUS Instance 2)
Bit 02: 0 = Alarm #3 Inactive, 1 = Alarm #3 Active (tag_ALARM_STATUS Instance 3)
Bit 03: 0 = Alarm #4 Inactive, 1 = Alarm #4 Active (tag_ALARM_STATUS Instance 4)
Bit 04: 0 = Alarm #5 Inactive, 1 = Alarm #5 Active (tag_ALARM_STATUS Instance 5)
Bit 05: 0 = Alarm #6 Inactive, 1 = Alarm #6 Active (tag_ALARM_STATUS Instance 6)
Bit 06: 0 = Alarm #7 Inactive, 1 = Alarm #7 Active (tag_ALARM_STATUS Instance 7)
Bit 07: 0 = Alarm #8 Inactive, 1 = Alarm #8 Active (tag_ALARM_STATUS Instance 8)
Bit 08: 1 = Alarm #1 Silenced (tag_ALARM_STATUS Instance 1)
Bit 09: 1 = Alarm #2 Silenced (tag_ALARM_STATUS Instance 2)
Bit 10: 1 = Alarm #3 Silenced (tag_ALARM_STATUS Instance 3)
Bit 11: 1 = Alarm #4 Silenced (tag_ALARM_STATUS Instance 4)
Bit 12: 1 = Alarm #5 Silenced (tag_ALARM_STATUS Instance 5)
Bit 13: 1 = Alarm #6 Silenced (tag_ALARM_STATUS Instance 6)
Bit 14: 1 = Alarm #7 Silenced (tag_ALARM_STATUS Instance 7)
Bit 15: 1 = Alarm #8 Silenced (tag_ALARM_STATUS Instance 8)

In sections 2.2.3 and 2.2.4 above, words 9 and 10 of the output assembly are defined as AI_ERROR_ACK and ALARM_ACTIONS respectively. The definition of the bits within those words follows:

Output Assembly Word 9 "EIP_ AI_ERROR_ACK"

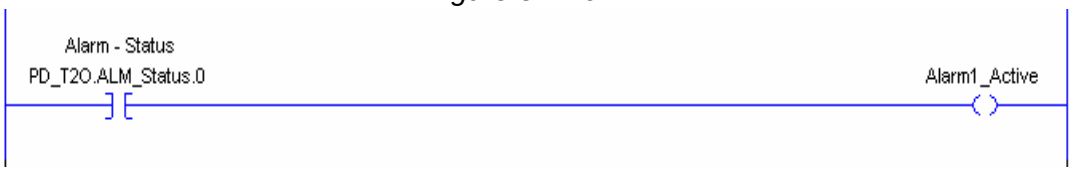
Bit 00: 1 = Acknowledge AI #1 Error (tag_UI_AI_ERROR_ACKNOWLEDGED Instance 1) Bit 01: 1 = Acknowledge AI #2 Error (tag_UI_AI_ERROR_ACKNOWLEDGED Instance 2) Bit 02: Reserved Bit 03: Reserved Bit 04: Reserved Bit 05: Reserved Bit 06: Reserved Bit 07: Reserved	Bit 08: Reserved Bit 09: Reserved Bit 10: Reserved Bit 11: Reserved Bit 12: Reserved Bit 13: Reserved Bit 14: Reserved Bit 15: Reserved

Output Assembly Word 9 "EIP_ AI_ERROR_ACK"

Bit 00: 1 = Clear Latched Alarm #1 (tag_ALARM_LATCH_ACTION Instance 1)
Bit 01: 1 = Clear Latched Alarm #2 (tag_ALARM_LATCH_ACTION Instance 2)
Bit 02: 1 = Clear Latched Alarm #3 (tag_ALARM_LATCH_ACTION Instance 3)
Bit 03: 1 = Clear Latched Alarm #4 (tag_ALARM_LATCH_ACTION Instance 4)
Bit 04: 1 = Clear Latched Alarm #5 (tag_ALARM_LATCH_ACTION Instance 5)
Bit 05: 1 = Clear Latched Alarm #6 (tag_ALARM_LATCH_ACTION Instance 6)
Bit 06: 1 = Clear Latched Alarm #7 (tag_ALARM_LATCH_ACTION Instance 7)
Bit 07: 1 = Clear Latched Alarm #8 (tag_ALARM_LATCH_ACTION Instance 8)
Bit 08: 1 = Silence Active Alarm #1 (tag_ALARM_SILENCE_ACTION Instance 1)
Bit 09: 1 = Silence Active Alarm #2 (tag_ALARM_SILENCE_ACTION Instance 2)
Bit 10: 1 = Silence Active Alarm #3 (tag_ALARM_SILENCE_ACTION Instance 3)
Bit 11: 1 = Silence Active Alarm #4 (tag_ALARM_SILENCE_ACTION Instance 4)
Bit 12: 1 = Silence Active Alarm #5 (tag_ALARM_SILENCE_ACTION Instance 5)
Bit 13: 1 = Silence Active Alarm #6 (tag_ALARM_SILENCE_ACTION Instance 6)
Bit 14: 1 = Silence Active Alarm #7 (tag_ALARM_SILENCE_ACTION Instance 7)
Bit 15: 1 = Silence Active Alarm #8 (tag_ALARM_SILENCE_ACTION Instance 8)

As an example, the logic below uses simple bit level instructions to pick up and annunciate the alarm 1 status in the event that it becomes active.

Figure 3.1.1c

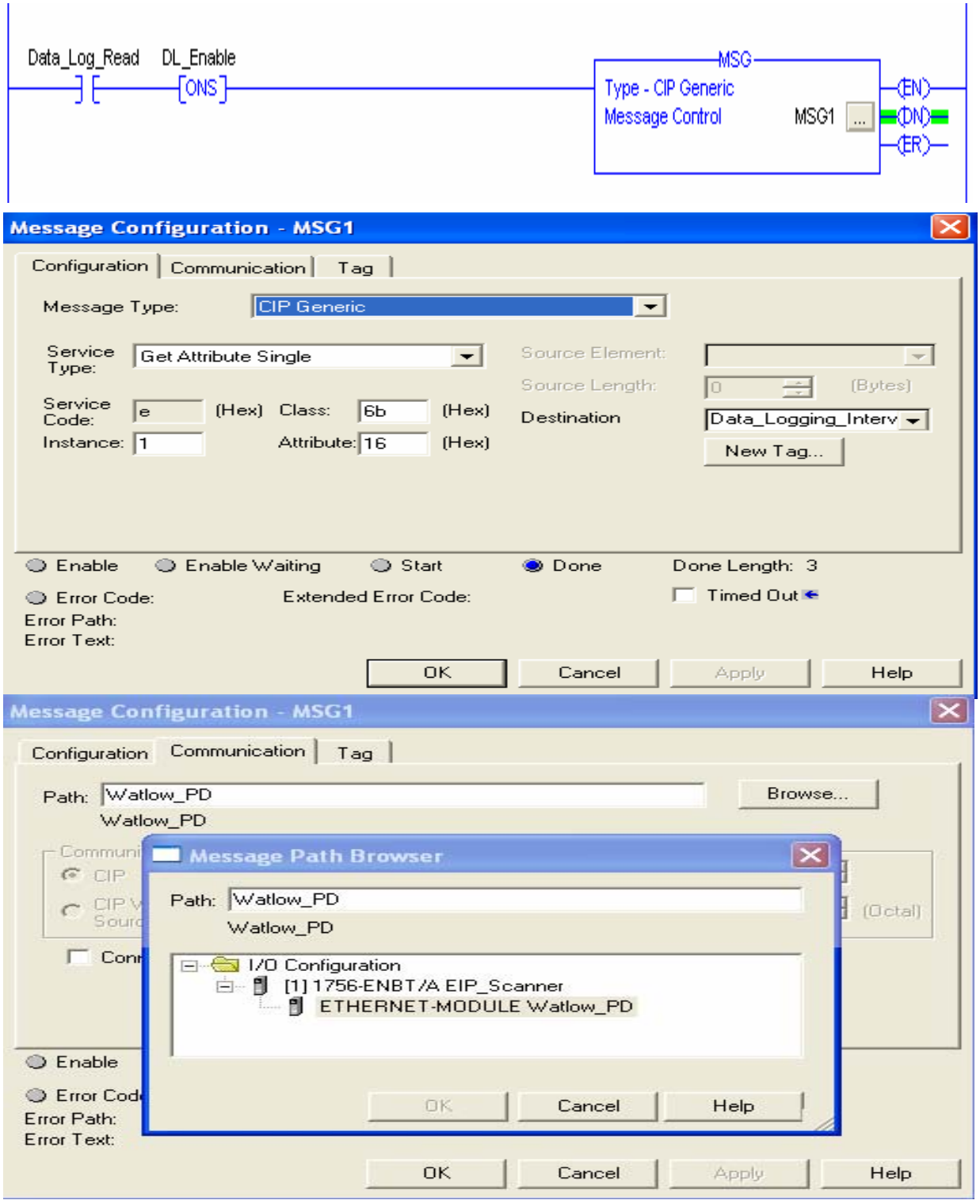


3.1.2 Explicit Messages - Ladder Logic Examples

Explicit messaging connections provide generic, multi-purpose communication paths between two devices. These connections are often referred to as just "messaging connections." Explicit messages provide the typical request/response-oriented network communication. As an example of a read

operation, the ladder logic below along with its associated configuration screen will read the current Data Logging Interval (seconds or minutes) value back from the PD. After entries are complete on the configuration tab proceed to the communication tab and click on the browse button to identify the path to the PD.

Figure 3.1.2a

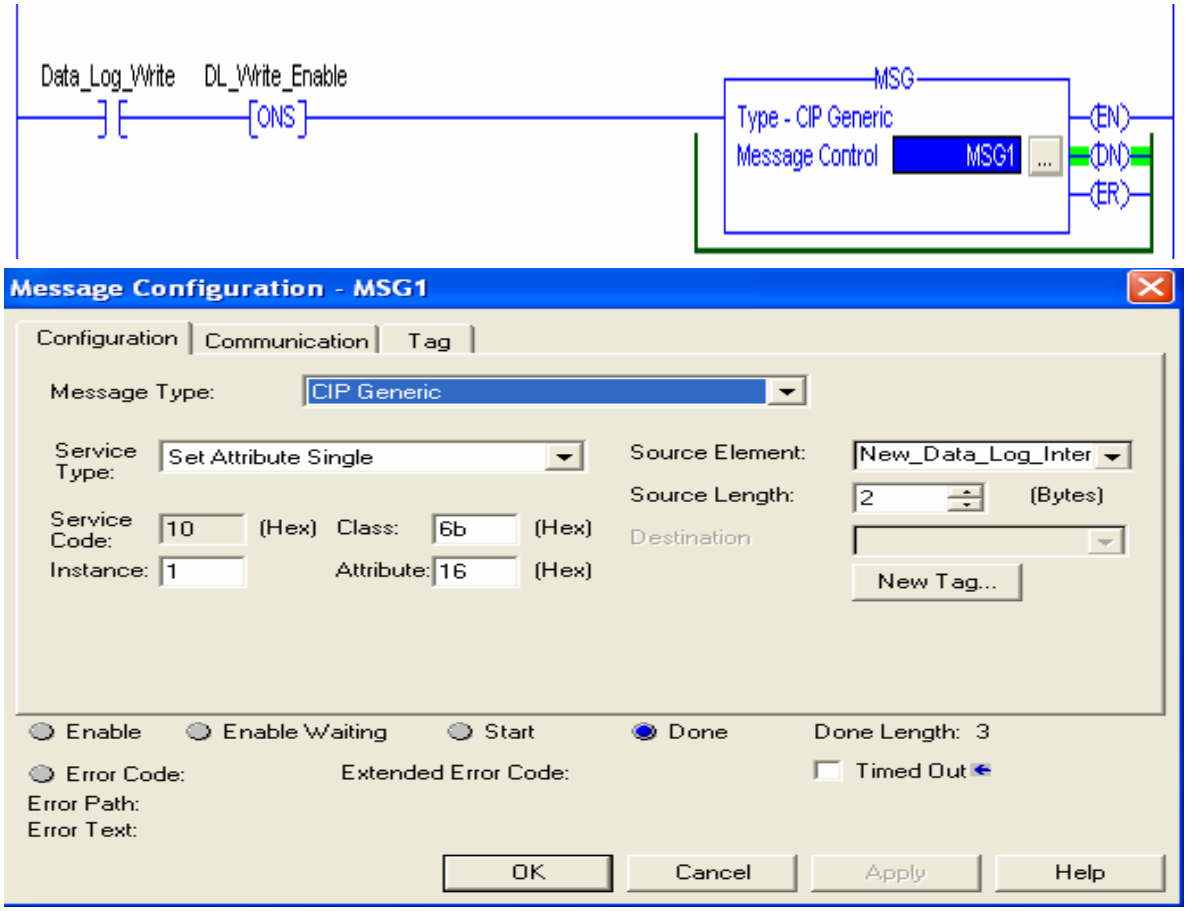


Upon activation of the Data_Log_Read input, the internal value will be read into the tag named Data_Logging_Interval.

Not much changes in the write example. The obvious changes are that the service now becomes a set operation and there needs to be a source tag (holding the new interval). In this case the data type is defined as an INT so the source length is two bytes. As in the configuration above, to complete the configuration, click on the communication tab and define the path to the PD.

When the tag named "Data_Log_Write is enabled the new logging interval will be sent out to the PD.

Figure 3.1.2b



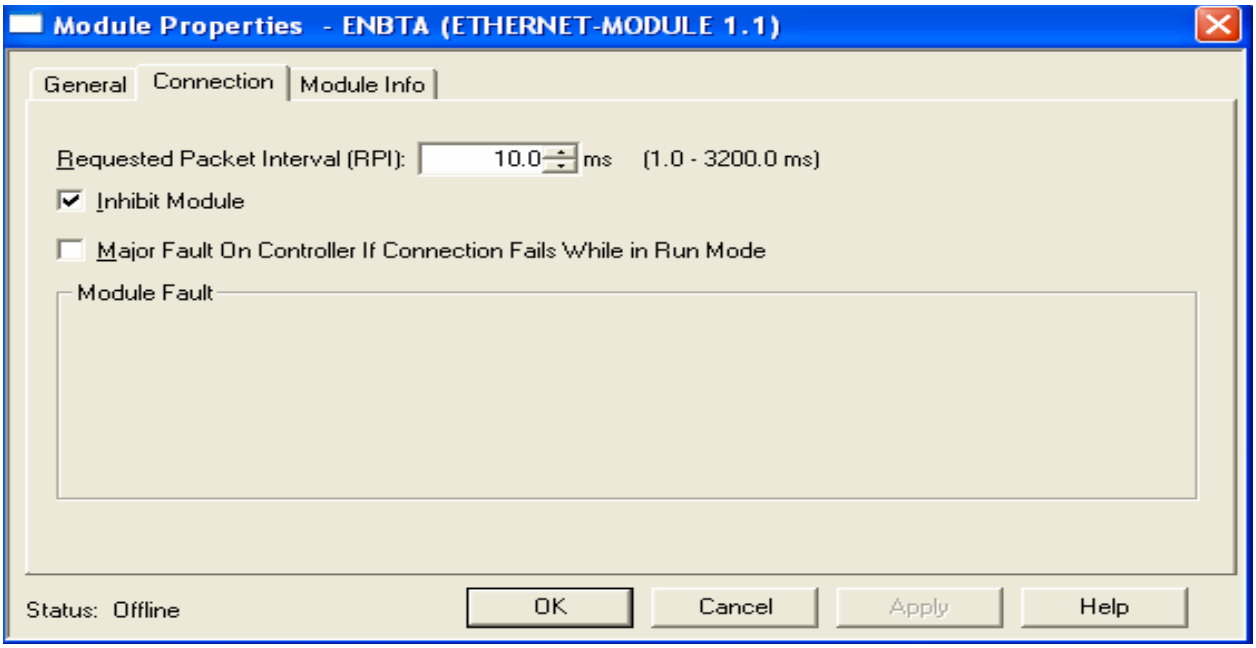
4.0 Changing the Assembly Size

The assembly object within the PD was built in such a way that there is a Static Assembly which cannot be changed and a Dynamic Assembly which can be built by the user. The Dynamic Assembly, input or output, becomes available along with the Static Assembly only after the size has been changed.

Note:
Implicit messaging should be and must be disabled when changing the size of either assembly. Failure to do so will generate errors.

Related to the note above go to the PD Module Property page and check Inhibit Module as shown below.

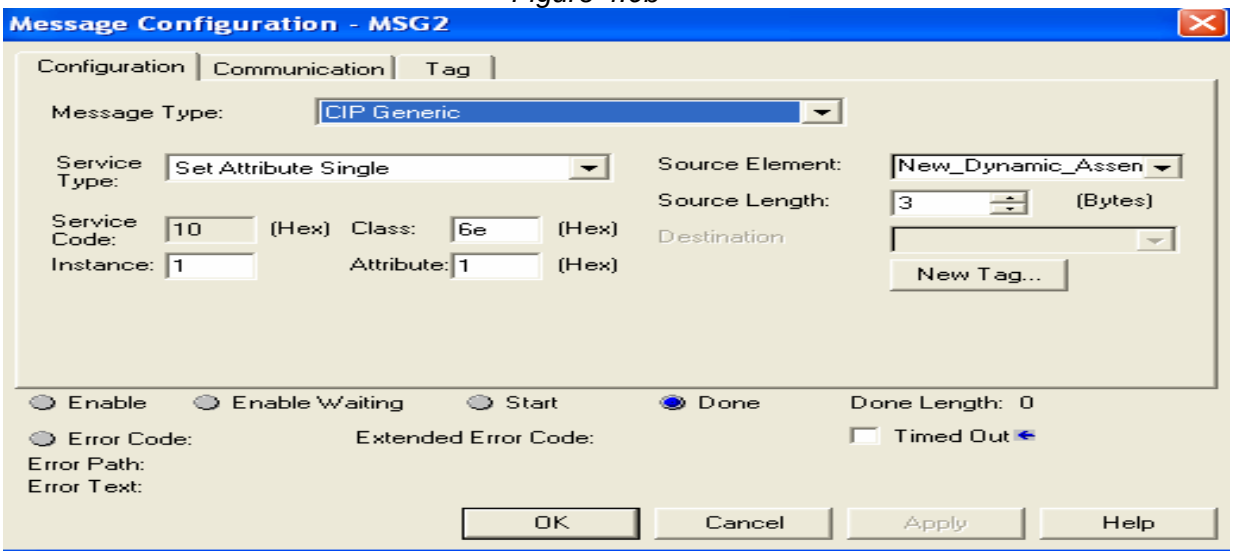
Figure 4.0a



Once the module has been inhibited insert a message instruction into your program. In the example logic below the O→T Dynamic Assembly will be increased to allow for the Autotune feature to be enabled. A value (in this case, 1) will be sent from the controller to the PD to start the Autotune feature.

In configuring the MSG instruction there are several points of interest that will require some focus. First, notice that the service type is Set Attribute. The value stored in the source element (New_Dynamic_Assembly) will be written to the first Dynamic Assembly Point identified above in section 2.2.4 as Class = 110, Instance = 1, and Attribute = 1. Below, these values are shown on the configuration screen in Hex.

Figure 4.0b



The Class, Instance, and Attribute to start Autotune in the PD follow:
- Class = 101
- Instance = 1
- Attribute = 44

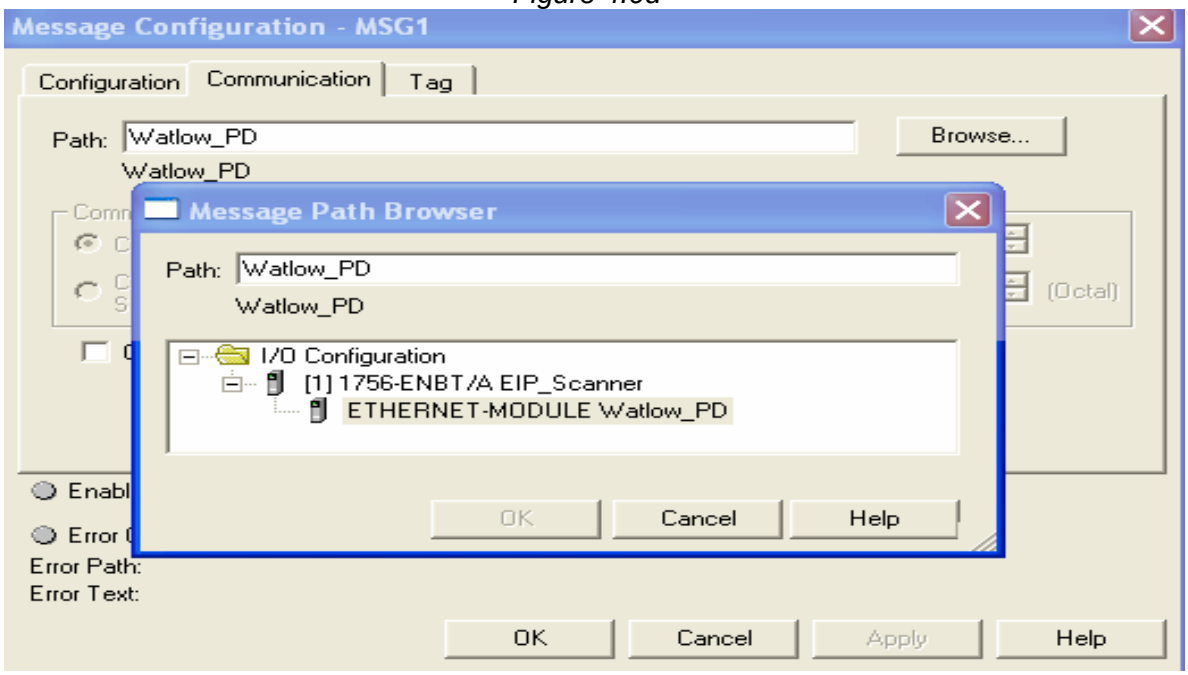
In this example the above values would be loaded into the tags identified below in Hex as:
- Class = 65
- Instance = 1
- Attribute = 2c

Figure 4.0c

New_Dynamic_Assembly	New_Dynamic_Assembly_Point
New_Dynamic_Assembly.Class	SINT
New_Dynamic_Assembly.Instance	SINT
New_Dynamic_Assembly.Attribute	SINT

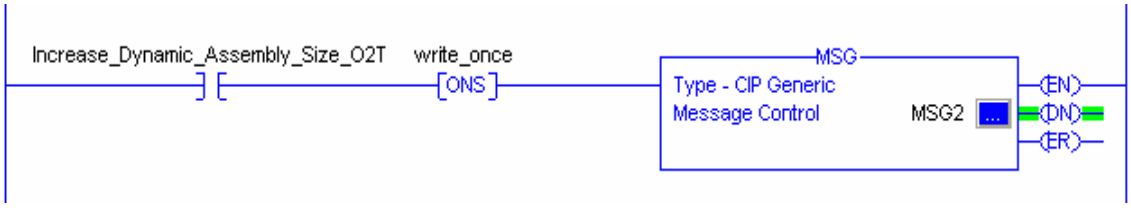
The source length is set at 3 bytes above and will always be 3 bytes when performing this operation (increasing or decreasing the assembly size). The last part of the configuration is to identify the path to the PD. Click on the communications tab and then click the browse button. Select the PD, and click OK. The configuration is now complete.

Figure 4.0d



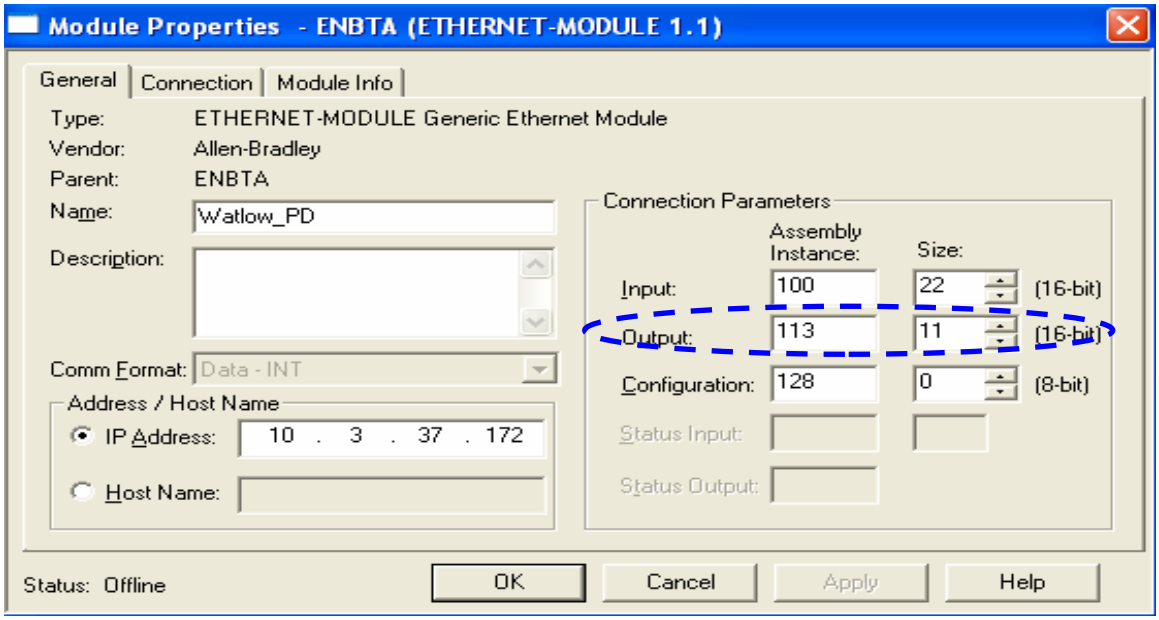
The O→T Dynamic Assembly will be increased after enabling the MSG instruction below.

Figure 4.0e



The last step in this process is to go offline and reconfigure the PD output assembly instance and size to accommodate for the new assembly size. The size was increased one word simply because that is the way this attribute was formatted (UINT).

Figure 4.0f



Prior to downloading this change back to the control, don't forget to go back to the connection tab (figure 4.0a above) and uncheck the Inhibit Module check box. After doing so download the changes back to the control. After going on-line with the control in the run mode, go to the Controller Tags for the PD outputs, you should see that the size increased by one word. In this example the 10th word would represent the PD Autotune feature. Go to monitor tags if not already there and enter the following values to either start or stop Autotune:
0 = Stop Autotune
1 = Start Autotune

Figure 4.0g

Watlow_PD:O	AB:ETHERNET_MODULE_IN...
Watlow_PD:O.Data	INT[11]
Watlow_PD:O.Data[0]	INT
Watlow_PD:O.Data[1]	INT
Watlow_PD:O.Data[2]	INT
Watlow_PD:O.Data[3]	INT
Watlow_PD:O.Data[4]	INT
Watlow_PD:O.Data[5]	INT
Watlow_PD:O.Data[6]	INT
Watlow_PD:O.Data[7]	INT
Watlow_PD:O.Data[8]	INT
Watlow_PD:O.Data[9]	INT
Watlow_PD:O.Data[10]	INT

This procedure can be duplicated to increase either the O→T or the T→O Dynamic Assemblies. What would change would be the assembly instance size where this would be dependent on the attribute you are seeking to read from or write to.

Name and Description	Web Page	Range (Scaling)	Iterations	Default	EIP Decimal (Hex)	Modbus	EIP Data Type	Access
Monitor Device								
Analog Input {1 or 2} - Active Process Value Indicates the process value displayed on web page and used by the control loop.	Monitor Device	-30,000,000 to 30,000,000 (/1000)	Analog Input 1 Analog Input 2		101/1/3 (65/1/3) 101/1/8 (65/1/8)	35-36 47-48	DINT	R
Digital Input {3 or 4} Value Indicates the state of the digital input.	Monitor Device	Inactive (0) Active (1)	Digital Input 3 Digital Input 4	Inactive (0)	101/1/21 (65/1/15) 101/1/26 (65/1/1A)	61 68	UINT	R
CT Input {3 or 4} - Active Process Value Indicates the process value displayed on web page and used by the control loop.	Monitor Device	-30,000,000 to 30,000,000 (/1000)	CT Input 3 CT Input 4		101/1/13 (65/1/D) 101/1/18 (65/1/12)	53-54 57-58	DINT	R
Analog Input {1 to 4} - Error Status Display active errors for the analog input.	Monitor Device	No Fault (0) Ambient Fault (1) Under Range Fault (2) Over Range Fault (3) Under Flow Fault (4) Over Flow Fault (5) INFOSENSE Fault (6) Lead Compensation Fault (7)	Analog Input 1 Analog Input 2 Analog Input 3 Analog Input 4		101/1/4 (65/1/4) 101/1/9 (65/1/9) 101/1/14 (65/1/E) 101/1/19 (65/1/13)	37 49 55 59	UINT	R
Failure Latching Acknowledge Resets latched input errors if sensor is repaired.	Monitor Device	No (0) Yes (1)	Loop 1 Loop 2	Yes (1)	101/1/5 (65/1/5) 101/1/10 (65/1/A)	38 50	UINT	R/W
Digital Input 3 - Switch To Digital Set Point Status Indicates whether Digital Input 3 has switched the loop to the digital setpoint.	Monitor Device	Inactive (0) Active (1)	Loop 1 Loop 2	Inactive (0)	101/1/24 (65/1/18) 101/1/29 (65/1/1D)	64 71	UINT	R
Digital Input 4 - Switch To Digital Set Point Status Indicates whether Digital Input 4 has switched the loop to the digital setpoint.	Monitor Device	Inactive (0) Active (1)	Loop 1 Loop 2	Inactive (0)	101/1/25 (65/1/19) 101/1/30 (65/1/1E)	65 72	UINT	R
Digital Input Switch Loop {1 or 2} Off Status Indicates whether a digital input has switched the loop off.	Monitor Device	Inactive (0) Active (1)	Loop 1 Loop 2	Inactive (0)	101/1/23 (65/1/17) 101/1/28 (65/1/1C)	63 70	UINT	R
Digital Input Switch Loop {1 or 2} to Manual Status Indicates whether a digital input has switched the loop to manual.	Monitor Device	Inactive (0) Active (1)	Loop 1 Loop 2	Inactive (0)	101/1/22 (65/1/16) 101/1/27 (65/1/1B)	62 69	UINT	R
Working Set Point Indicates the active set point, whether the auto set point, digital set point or the ramp to set point.	Monitor Device	(/1000)	Loop 1 Loop 2	75000	101/1/33 (65/1/21) 101/1/41 (65/1/29)	78-79 92-93	DINT	R
Loop Power (Indirect) Indicates the heat (indirect) output power	Monitor Device	0 to 10,000 (/100)	Loop 1 Loop 2		101/1/37 (65/1/25) 101/1/45 (65/1/2D)	83 97	INT	R
Loop Power (Direct) Indicates the cool (direct) output power.	Monitor Device	0 to 10,000 (/100)	Loop 1 Loop 2		101/1/38 (65/1/26) 101/1/46 (65/1/2E)	84 98	INT	R
Auto Set Point Set the closed loop (auto) setpoint for control loop.	Monitor Device	(/1000)	Loop 1 Loop 2	75000	101/1/32 (65/1/20) 101/1/40 (65/1/28)	76-77 90-91	DINT	R/W
Manual Set Point Set the a fixed output level, in percent power, in manual mode.	Monitor Device	-10,000 to 10,000 (/100)	Loop 1 Loop 2	0	101/1/31 (65/1/1F) 101/1/39 (65/1/27)	75 89	INT	R/W
Mode Choose open loop (manual) or closed loop (auto) control.	Monitor Device	Off (0) Manual (1) Auto (2)	Loop 1 Loop 2	Off (0)	101/1/34 (65/1/22) 101/1/42 (65/1/2A)	80 94	UINT	R/W
Tuning Status/Control Loop Status	Monitor Device	No (0) Yes (1)	Loop 1 Loop 2	No (0)	101/1/35 (65/1/23) 101/1/43 (65/1/2B)	81 95	UINT	R/W

Name and Description	Web Page	Range (Scaling)	Iterations	Default	EIP Decimal (Hex)	Modbus	EIP Data Type	Access
Alarm Status Indicates the status of the Alarm.	Monitor Device	Inactive or Off (0) Active (1) Silenced (2)	Alarm 1 Alarm 2 Alarm 3 Alarm 4 Alarm 5 Alarm 6 Alarm 7 Alarm 8	Inactive or Off (0)	101/1/47 (65/1/2F) 101/1/53 (65/1/35) 101/1/59 (65/1/3B) 101/1/65 (65/1/41) 101/1/71 (65/1/47) 101/1/77 (65/1/4D) 101/1/83 (65/1/53) 101/1/89 (65/1/59)	103 116 129 142 155 168 181 194	UINT	R
Latching Action Select to clear a latched alarm after the process value returns to normal.	Monitor Device	No (0) Yes (1)	Alarm 1 Alarm 2 Alarm 3 Alarm 4 Alarm 5 Alarm 6 Alarm 7 Alarm 8	No (0)	101/1/52 (65/1/34) 101/1/58 (65/1/3A) 101/1/64 (65/1/40) 101/1/70 (65/1/46) 101/1/76 (65/1/4C) 101/1/82 (65/1/52) 101/1/88 (65/1/58) 101/1/94 (65/1/5E)	111 124 137 150 163 176 189 202	UINT	R/W
Silence Action Select to silence an alarm.	Monitor Device	No (0) Yes (1)	Alarm 1 Alarm 2 Alarm 3 Alarm 4 Alarm 5 Alarm 6 Alarm 7 Alarm 8	No (0)	101/1/51 (65/1/33) 101/1/57 (65/1/39) 101/1/63 (65/1/3F) 101/1/69 (65/1/45) 101/1/75 (65/1/4B) 101/1/81 (65/1/51) 101/1/87 (65/1/57) 101/1/93 (65/1/5D)	110 123 136 149 162 175 188 201	UINT	R/W
Analog Input {1 or 2} - Filtered Process Value Indicates the filtered process value measured by the corresponding analog input.	Monitor Device	-30,000,000 to 30,000,000 (/1000)	Analog Input 1 Analog Input 2		101/1/2 (65/1/2) 101/1/7 (65/1/7)	33-34 45-46	DINT	R
Analog Input {1 or 2} - Process Value Indicates the unfiltered process value measured by the corresponding analog input.	Monitor Device	-30,000,000 to 30,000,000 (/1000)	Analog Input 1 Analog Input 2		101/1/1 (65/1/1) 101/1/6 (65/1/6)	31-32 43-44	DINT	R
CT Input {3 or 4} - Filtered Process Value Indicates the filtered process value measured by the corresponding analog input.	Monitor Device		CT Input 3 CT Input 4		Web page only	Web page only		
CT Input {3 or 4} - Process Value Indicates the unfiltered process value measured by the corresponding analog input .	Monitor Device		CT Input 3 CT Input 4		Web page only	Web page only		
Alarm Latching / Silence Action Set the coresponding bit to clear a latched alarm. Bits 1 through 8 correspond to alarms 1 to 8.	Monitor Device	-32,768 to 32,767		0	101/1/100 (65/1/64)		WORD	R/W
Alarm Status Read the corresponding bit to determine the alarm status. 0 = inactive, 1 = active. Bits 1 to 8 correspond to alarms 1 to 8.	Monitor Device	-32,768 to 32,767		0	101/1/98 (65/1/62)		WORD	R
Analog Input Failure Latching Acknowledge Set the corresponding bit to acknowledge the input error. 1 = acknowledge. Bit 1 corresponds to analog input 1 and bit 2 corresponds to analog input 2.	Monitor Device	-32,768 to 32,767		0	101/1/99 (65/1/63)		WORD	R/W
Control Power Output	Monitor Device	-10000 to 10000 (/100)	Loop 1 Loop 2	0	101/1/96 (65/1/60)		INT	R

Name and Description	Web Page	Range (Scaling)	Iterations	Default	EIP Decimal (Hex)	Modbus	EIP Data Type	Access
Digital I/O State Read and set the states of the digital I/O. 0 = off and 1 = on. Bits 0 and 1 correspond to digital inputs 1 and 2. Bits 8, 9, 10, and 11 correspond to digital outputs 1, 2, 3, and 4. All other bits reserved	Monitor Device	-32,768 to 32,767		0	101/1/95 (65/1/5F)		WORD	R/W
Device Configuration > Inputs > Analog Input {1 or 2}								
Sensor Type Set the sensor type.	Analog Input {1 or 2} Configuration	None (0) Thermocouple (1) RTD (2) Voltage Process (3) Current Process (4) INFOSENSE PnP (5)	Analog Input 1 Analog Input 2	None (0)	102/1/1 (66/1/1) 101/1/5 (65/2/1)	251 281	UINT	R/W
Thermocouple Parameters Set the thermocouple type.	Analog Input {1 or 2} Configuration	J (0) K (1) T (2) E (3) N (4) C (5) D (6) PTII (7) R (8) S (9) B (10)	Analog Input 1 Analog Input 2	J (0)	102/1/2 (66/1/2) 102/2/2 (66/2/2)	252 282	UINT	R/W
RTD Curve Set the RTD linearization.	Analog Input {1 or 2} Configuration	DIN 0.385 (0)	Analog Input 1 Analog Input 2	DIN 0.385 (0)	102/1/3 (66/1/3) 102/2/3 (66/2/3)	253 283	UINT	R/W
Process Precision Indicates the number of decimal places displayed on the web page for a process input. This can be changed using the Series PD web page.	Analog Input {1 or 2} Configuration	0 (0) 0.0 (1) 0.00 (2) 0.000 (3)	Analog Input 1 Analog Input 2	0 (0)	108/1/34 (6C/1/22) 108/1/38 (6C/1/26)	1108 1119	UINT	R
Process Units Indicates the units for process type inputs displayed in the web browser	Analog Input {1 or 2} Configuration	Up to four alphanumeric characters	Analog Input 1 Analog Input 2		108/1/36 (6C/1/24) 108/1/40 (6C/1/28)	1110-1111 1121-1122	SHORT_STRING	R
Low Process Scale Set the value that will be displayed when the analog input value is at its minimum, as determined by the Low Voltage Scale or Low Current Scale.	Analog Input {1 or 2} Configuration	-30,000,000 to 30,000,000 (/1000)	Analog Input 1 Analog Input 2	-30,000,000	102/1/8 (66/1/8) 102/2/8 (66/2/8)	262-263 292-293	DINT	R/W
High Process Scale Set the value that will be displayed when the analog input value is at its maximum, as determined by the High Voltage Scale or High Current Scale.	Analog Input {1 or 2} Configuration	-30,000,000 to 30,000,000 (/1000)	Analog Input 1 Analog Input 2	30,000,000	102/1/9 (66/1/9) 102/2/9 (66/2/9)	264-265 294-295	DINT	R/W
Low Voltage Scale Set the input process voltage (in Volts) that will correspond to the Low Process Scale.	Analog Input {1 or 2} Configuration	0 to 10,000 (/1000)	Analog Input 1 Analog Input 2	0	102/1/6 (66/1/6) 102/2/6 (66/2/6)	258-259 288-289	DINT	R/W
High Voltage Scale Set the input process voltage (in Volts) that will correspond to the High Process Scale.	Analog Input {1 or 2} Configuration	0 to 10,000 (/1000)	Analog Input 1 Analog Input 2	10000	102/1/7 (66/1/7) 102/2/7 (66/2/7)	260-261 290-291	DINT	R/W
Low Current Scale Set the input process current (in milliamps) that will correspond to the Low Process Scale.	Analog Input {1 or 2} Configuration	0 to 20,000 (/1000)	Analog Input 1 Analog Input 2	4000	102/1/4 (66/1/4) 102/2/4 (66/2/4)	254-255 284-285	DINT	R/W

Name and Description	Web Page	Range (Scaling)	Iterations	Default	EIP Decimal (Hex)	Modbus	EIP Data Type	Access
High Current Scale Set the input process current (in milliamps) that will correspond to the High Process Scale.	Analog Input {1 or 2} Configuration	0 to 20,000 (/1000)	Analog Input 1 Analog Input 2	20000	102/1/5 (66/1/5) 102/2/5 (66/2/5)	256-257 286-287	DINT	R/W
Temperature Process Value Units Indicates the temperature units displayed in the web pages for a thermocouple and RTD input. This can be set in the web page.	Analog Input {1 or 2} Configuration	Fahrenheit (0) Celsius (1)	Analog Input 1 Analog Input 2	Fahrenheit (0)	108/1/35 (6C/1/23) 108/1/39 (6C/1/27)	1109 1120	UINT	R
Temperature Process Value Precision Indicates the number of decimal places displayed in the web pages for a thermocouple or RTD input. This can be set in the web page.	Analog Input {1 or 2} Configuration	0 (0) 0.0 (1)	Analog Input 1 Analog Input 2	0 (0)	108/1/33 (6C/1/21) 108/1/37 (6C/1/25)	1107 1118	UINT	R
Filter Method Select a filter method to smooth out a rapidly changing input signal.	Analog Input {1 or 2} Configuration	Off (0) First Order (1)	Analog Input 1 Analog Input 2	Off (0)	102/1/11 (66/1/B) 102/2/11 (66/2/B)	268 298	UINT	R/W
Filter Time Base Set the filter time. A higher value will smooth out the signal more.	Analog Input {1 or 2} Configuration	100 to 60,000 (/1000)	Analog Input 1 Analog Input 2	100	102/1/12 (66/1/C) 102/2/12 (66/2/C)	269-270	DINT	R/W
Single Offset Value Set a value to compensate for the input's lead resistance and sensor inaccuracy.	Analog Input {1 or 2} Configuration	-9,999,000 to 9,999,000 (/1000)	Analog Input 1 Analog Input 2	0	102/1/10 (66/1/A) 102/2/10 (66/2/A)	266-267 296-297	DINT	R/W
Device Configuration > Inputs > CT Input {3 or 4}								
Function Set whether to enable the CT input.	CT Input {3 or 4} Configuration	Off (0) CT Current (6)	CT Input 3 CT Input 4	Off (0)	102/3/1 (66/3/1) 102/4/1 (66/4/1)	311 331	UINT	R/W
CT Precision Indicates the number of decimal places displayed in the web page for CT inputs. This can be set in the web page.	CT Input {3 or 4} Configuration	0 (0) 0.0 (1) 0.00 (2) 0.000 (3)	CT Input 3 CT Input 4	0 (0)	108/1/42 (6C/1/2A) 108/1/46 (6C/1/2E)	1124 1128	UINT	R
CT Units Indicates the units displayed in the web page for CT inputs. This can be set in the web page	CT Input {3 or 4} Configuration	Up to four alphanumeric characters	CT Input 3 CT Input 4		108/1/44 (6C/1/2C) 108/1/48 (6C/1/30)	1125-1126 1129-1130	SHORT_STRING	R
Low CT Scale Set the value that will be displayed when the current transformer (CT) input is at its minimum, as determined by the Low Current Scale.	CT Input {3 or 4} Configuration	-30,000,000 to 30,000,000 (/1000)	CT Input 3 CT Input 4	-30,000,000	102/3/8 (66/3/8) 102/4/8 (66/4/8)	316-317 336-337	DINT	R/W
High CT Scale Set the value that will be displayed when the current transformer (CT) input is at its maximum, as determined by the High Current Scale.	CT Input {3 or 4} Configuration	-30,000,000 to 30,000,000 (/1000)	CT Input 3 CT Input 4	30,000,000	102/3/9 (66/3/9) 102/4/9 (66/4/9)	318-319 338-339	DINT	R/W
Low Current Scale Set the input process current (in milliamps) that will correspond to the Low CT Scale.	CT Input {3 or 4} Configuration	0 to 50,000 (/1000)	CT Input 3 CT Input 4	0	102/3/4 (66/3/4) 102/4/4 (66/4/4)	312-313 332-333	DINT	R/W
High Current Scale Set the input process current (in milliamps) that will correspond to the High CT Scale.	CT Input {3 or 4} Configuration	0 to 50,000 (/1000)	CT Input 3 CT Input 4	20,000	102/3/5 (66/3/5) 102/4/5 (66/4/5)	314-315 334-335	DINT	R/W
Output Select output to monitor with the CT input.	CT Input {3 or 4} Configuration	Output 1 (0) Output 2 (1) Output 3 (2) Output 4 (3)	CT Input 3 CT Input 4	Output 2 (1)	102/3/13 (66/3/D) 102/4/13 (66/4/D)	322 342	UINT	R/W
Single Offset Value Set a value to compensate for the input's lead resistance and signal inaccuracy.	CT Input {3 or 4} Configuration	-9,999,000 to 9,999,000 (/1000)	CT Input 3 CT Input 4	0	102/3/10 (66/3/A) 102/4/10 (66/4/A)	320-321 340-341	DINT	R/W

Name and Description	Web Page	Range (Scaling)	Iterations	Default	EIP Decimal (Hex)	Modbus	EIP Data Type	Access
Device Configuration > Inputs > Digital Input {3 or 4}								
Function Set the function for the digital input.	Digital Input {3 or 4} Configuration	Off (0) Acknowledge Alarm (1) Switch To Manual Control (2) Switch Control Loop Off (3) Digital Setpoint (4) Pause Data Logging (5)	Digital Input 3 Digital Input 4	Off (0)	103/1/1 (67/1/1) 103/2/1 (67/2/1)	351 371	UINT	R/W
Active State Select which state will activate the digital input function.	Digital Input {3 or 4} Configuration	False (0) True (1)	Digital Input 3 Digital Input 4	False (0)	103/1/2 (67/1/2) 103/2/2 (67/2/2)	352 371	UINT	R/W
Acknowlege Alarm: Alarm Action Select what action will occur when the digital input is used to acknowledge an alarm.	Digital Input {3 or 4} Configuration	Silence Alarm (0) Acknowledge Alarm (1) Silence and Acknowledge Alarm (2)	Digital Input 3 Digital Input 4	Silence Alarm (0)	103/1/17 (67/1/11) 103/2/17 (67/2/11)	368 388	UINT	R/W
Acknowledge Alarm 1 Select to use the digital input to acknowledge Alarm 1.	Digital Input {3 or 4} Configuration	No (0) Yes (1)	Digital Input 3 Digital Input 4	No (0)	103/1/3 (67/1/3) 103/2/3 (67/2/3)	353 373	UINT	R/W
Acknowledge Alarm 2 Select to use the digital input to acknowledge Alarm 2.	Digital Input {3 or 4} Configuration	No (0) Yes (1)	Digital Input 3 Digital Input 4	No (0)	103/1/4 (67/1/4) 103/2/4 (67/2/4)	354 374	UINT	R/W
Acknowledge Alarm 3 Select to use the digital input to acknowledge Alarm 3.	Digital Input {3 or 4} Configuration	No (0) Yes (1)	Digital Input 3 Digital Input 4	No (0)	103/1/5 (67/1/5) 103/2/5 (67/2/5)	355 375	UINT	R/W
Acknowledge Alarm 4 Select to use the digital input to acknowledge Alarm 4.	Digital Input {3 or 4} Configuration	No (0) Yes (1)	Digital Input 3 Digital Input 4	No (0)	103/1/6 (67/1/6) 103/2/6 (67/2/6)	356 376	UINT	R/W
Acknowledge Alarm 5 Select to use the digital input to acknowledge Alarm 5.	Digital Input {3 or 4} Configuration	No (0) Yes (1)	Digital Input 3 Digital Input 4	No (0)	103/1/7 (67/1/7) 103/2/7 (67/2/7)	357 377	UINT	R/W
Acknowledge Alarm 6 Select to use the digital input to acknowledge Alarm 6.	Digital Input {3 or 4} Configuration	No (0) Yes (1)	Digital Input 3 Digital Input 4	No (0)	103/1/8 (67/1/8) 103/2/8 (67/2/8)	358 378	UINT	R/W
Acknowledge Alarm 7 Select to use the digital input to acknowledge Alarm 7.	Digital Input {3 or 4} Configuration	No (0) Yes (1)	Digital Input 3 Digital Input 4	No (0)	103/1/9 (67/1/9) 103/2/9 (67/2/9)	359 379	UINT	R/W
Acknowledge Alarm 8 Select to use the digital input to acknowledge Alarm 8.	Digital Input {3 or 4} Configuration	No (0) Yes (1)	Digital Input 3 Digital Input 4	No (0)	103/1/10 (67/1/A) 103/2/10 (67/2/A)	360 380	UINT	R/W
Switch To Manual Control Loop 1 Select to use digital input to switch Loop 1 to manual control mode.	Digital Input {3 or 4} Configuration	No (0) Yes (1)	Digital Input 3 Digital Input 4	No (0)	103/1/11 (67/1/B) 103/2/11 (67/2/B)	361 381	UINT	R/W
Switch To Manual Control Loop 2 Select to use the digital input to switch Loop 2 to manual control mode.	Digital Input {3 or 4} Configuration	No (0) Yes (1)	Digital Input 3 Digital Input 4	No (0)	103/1/12 (67/1/C) 103/2/12 (67/2/C)	362 382	UINT	R/W
Switch Control Loop 1 Off Select to use the digital input to switch Loop 1 off.	Digital Input {3 or 4} Configuration	No (0) Yes (1)	Digital Input 3 Digital Input 4	No (0)	103/1/13 (67/1/D) 103/2/13 (67/2/D)	363 383	UINT	R/W
Switch Control Loop 2 Off Select to use the digital input to switch Loop 2 off.	Digital Input {3 or 4} Configuration	No (0) Yes (1)	Digital Input 3 Digital Input 4	No (0)	103/1/14 (67/1/E) 103/2/14 (67/2/E)	364 384	UINT	R/W
Digital Set Point Loop Select which loop's set point is affected by the digital input.	Digital Input {3 or 4} Configuration	Loop 1 (0) Loop 2 (1)	Digital Input 3 Digital Input 4	Loop 1 (0)	103/1/15 (67/1/F) 103/2/15 (67/2/F)	365 385	UINT	R/W

Name and Description	Web Page	Range (Scaling)	Iterations	Default	EIP Decimal (Hex)	Modbus	EIP Data Type	Access
Digital Setpoint Set the set point that will take effect when this digital input is activated.	Digital Input {3 or 4} Configuration	-30,000,000 to 30,000,000 (/1000) Depends on sensor type.	Digital Input 3 Digital Input 4	75,000	103/1/16 (67/1/10) 103/2/16 (67/2/10)	366-367 386-387	DINT	R/W
Device Configuration > Control Loops > Loop {1 or 2} Loop Settings								
Loop Action Select the action of the loop as Indirect (heat only), Direct (cool only) or Dual (Heat and Cool).	Control Loop {1 or 2} Configuration	Off (0) Heat (Indirect) (1) Cool (Direct) (2) Heat/Cool (Indirect/Direct) (3)	Loop 1 Loop 2	Off (0)	106/1/3 (6A/1/3) 106/2/3 (6A/2/3)	653 773	UINT	R/W
Loop Heat (Indirect) Algorithm Select the algorithm to use for heat (indirect) control.	Control Loop {1 or 2} Configuration	On/Off (0) PID (1)	Loop 1 Loop 2	PID (1)	106/1/1 (6A/1/1) 106/2/1 (6A/2/1)	651 771	UNIT	R/W
Loop Direct (Cool) Algorithm Select the algorithm to use for cool (direct) control.	Control Loop {1 or 2} Configuration	On/Off (0) PID (1)	Loop 1 Loop 2	PID (1)	106/1/2 (6A/1/2) 106/2/2 (6A/2/2)	652 772	UNIT	R/W
Failure Latching Select whether input errors clear automatically when the input signal is valid again.	Control Loop {1 or 2} Configuration	Off (0) On (1)	Loop 1 Loop 2	Off (0)	106/1/7 (6A/1/7) 106/2/7 (6A/2/7)	660 780	UINT	R/W
Output Transition from Auto Mode Select how the output will respond to an input failure	Control Loop {1 or 2} Configuration	Off (0) Fixed Power (1) Bumpless Power (2)	Loop 1 Loop 2	Off (0)	106/1/6 (6A/1/6) 106/2/6 (6A/2/6)	658 778	UNIT	R/W
Failure Fixed Power Set the output power level that will take effect if Output Transition from Auto to Manual is set to Fixed Power and there is an input failure.	Control Loop {1 or 2} Configuration	-10,000 to 10,000 (/100)	Loop 1 Loop 2	0	106/1/8 (6A/1/8) 106/2/8 (6A/2/8)	661 781	INT	R/W
Set Point: Limit Low Set the minimum auto (closed loop) set point allowed.	Control Loop {1 or 2} Configuration	-30,000,000 to 30,000,000 (/1000) Depends on sensor type.	Loop 1 Loop 2	Minimum for sensor type	106/1/4 (6A/1/4) 106/2/4 (6A/2/4)	654-655 774-775	DINT	R/W
Set Point: Limit High Set the maximum auto (closed loop) set point allowed.	Control Loop {1 or 2} Configuration	-30,000,000 to 30,000,000 (/1000) Depends on sensor type.	Loop 1 Loop 2	Maximum for sensor type	106/1/5 (6A/1/5) 106/2/5 (6A/2/5)	656-657 776-777	DINT	R/W
On/Off Hysteresis: Heat (Indirect) Set the control switching hysteresis for on/off, heat (indirect) control. This determines how far into the "on" region the input needs to move before the output turns on.	Control Loop {1 or 2} Configuration	1,000 to 99,000 (/1000)	Loop 1 Loop 2	3,000	106/1/9 (6A/1/9) 106/2/9 (6A/2/9)	662-663 782-783	DINT	R/W
On/Off Hysteresis: Cool (Direct) Set the control switching hysteresis for on/off, cool (direct) control. This determines how far into the "on" region the input needs to move before the output turns on.	Control Loop {1 or 2} Configuration	1,000 to 99,000 (/1000)	Loop 1 Loop 2	3,000	106/1/10 (6A/1/A) 106/2/10 (6A/2/A)	664-665 784-785	DINT	R/W
Start Autotune Activates autotuning of the PID values.	Control Loop {1 or 2} Configuration	No (0) Yes (1)	Loop 1 Loop 2	No (0)	101/1/36 (65/1/24) 101/1/44 (65/1/2C)	82 96	UINT	R/W
Autotune Set Point Set Autotune set point in percent.	Control Loop {1 or 2} Configuration	50 to 150	Loop 1 Loop 2	90	106/1/11 (6A/1/B) 106/2/11 (6A/2/B)	666 786	INT	R/W
PID Sets Select to use single or multiple PID sets for the loop.	Control Loop {1 or 2} Configuration	Single (0) Multiple (1)	Loop 1 Loop 2	Single (0)	106/1/12 (6A/1/C) 106/2/12 (6A/2/C)	667 787	UINT	R/W

Name and Description	Web Page	Range (Scaling)	Iterations	Default	EIP Decimal (Hex)	Modbus	EIP Data Type	Access
Ramp Action Select what event(s) trigger a ramp to set point.	Control Loop {1 or 2} Configuration	Off (0) Startup (1) SP Change (2) Startup and SP Change (3)	Loop 1 Loop 2	Off (0)	106/1/58 (6A/1/3A) 106/2/58 (6A/2/3A)	757 877	UINT	R/W
Ramp Rate Set the interval of degrees or units that the ramping set point will change per minute or hour, as determined by the Ramp Interval setting.	Control Loop {1 or 2} Configuration	0 to 9,999,000 (/1000)	Loop 1 Loop 2	100,000	106/1/60 (6A/1/3C) 106/2/60 (6A/2/3C)	759-760 879-880	DINT	R/W
Ramp Interval Select the time unit that applies to the Ramp Rate parameter.	Control Loop {1 or 2} Configuration	Minute (0) Hour (1)	Loop 1 Loop 2	Minute (0)	106/1/59 (6A/1/3B) 106/2/59 (6A/2/3B)	758 878	UINT	R/W
Device Configuration > Control Loops > Loop {1 or 2} Multiple PID Sets								
Cross Over Source Specify whether to switch the PID sets based on the set point or process value.	Multiple PID Loop {1 or 2} Configuration	Process Value (0) Set Point (1)	Loop 1 Loop 2	Process Value (0)	106/1/13 (6A/1/D) 106/2/13 (6A/2/D)	668 788	UINT	R/W
Heat (Indirect) Propband Set the heat (indirect) proportional band in process units.	Multiple PID Loop {1 or 2} Configuration	1,000 to 999,000 (/1000)	Loop 1 Set 1 Loop 1 Set 2 Loop 1 Set 3 Loop 1 Set 4 Loop 1 Set 5 Loop 2 Set 1 Loop 2 Set 2 Loop 2 Set 3 Loop 2 Set 4 Loop 2 Set 5	25,000	106/1/19 (6A/1/13) 106/1/27 (6A/1/1B) 106/1/35 (6A/1/23) 106/1/43 (6A/1/2B) 106/1/51 (6A/1/33) 106/2/19 (6A/2/13) 106/2/27 (6A/2/1B) 106/2/35 (6A/2/23) 106/2/43 (6A/2/2B) 106/2/51 (6A/2/33)	679-680 695-696 711-712 727-728 743-744 799-800 815-816 831-832 847-848 863-864	DINT	R/W
Heat (Indirect) Integral Set the heat (indirect) integral in minutes per repeat.	Multiple PID Loop {1 or 2} Configuration	0 to 99,990 (/1000)	Loop 1 Set 1 Loop 1 Set 2 Loop 1 Set 3 Loop 1 Set 4 Loop 1 Set 5 Loop 2 Set 1 Loop 2 Set 2 Loop 2 Set 3 Loop 2 Set 4 Loop 2 Set 5	0	106/1/20 (6A/1/14) 106/1/28 (6A/1/1C) 106/1/36 (6A/1/24) 106/1/44 (6A/1/2C) 106/1/52 (6A/1/34) 106/2/20 (6A/2/14) 106/2/28 (6A/2/1C) 106/2/36 (6A/2/24) 106/2/44 (6A/2/2C) 106/2/52 (6A/2/34)	681-682 697-698 713-714 729-730 745-746 801-802 817-818 833-834 849-850 865-866	DINT	R/W
Heat (Indirect) Derivative Set the heat (indirect) derivative time in minutes.	Multiple PID Loop {1 or 2} Configuration	0 to 9,990 (/1000)	Loop 1 Set 1 Loop 1 Set 2 Loop 1 Set 3 Loop 1 Set 4 Loop 1 Set 5 Loop 2 Set 1 Loop 2 Set 2 Loop 2 Set 3 Loop 2 Set 4 Loop 2 Set 5	0	106/1/21 (6A/1/15) 106/1/29 (6A/1/1D) 106/1/37 (6A/1/25) 106/1/45 (6A/1/2D) 106/1/53 (6A/1/35) 106/2/21 (6A/2/15) 106/2/29 (6A/2/1D) 106/2/37 (6A/2/25) 106/2/45 (6A/2/2D) 106/2/53 (6A/2/35)	683-684 699-700 715-716 731-732 747-748 803-804 819-820 835-836 851-852 867-868	DINT	R/W

Name and Description	Web Page	Range (Scaling)	Iterations	Default	EIP Decimal (Hex)	Modbus	EIP Data Type	Access
Heat (Indirect) Deadband Set the offset of the heat (indirect) proportional band from set point in process units.	Multiple PID Loop {1 or 2} Configuration	0 to 999,000 (/1000)	Loop 1 Set 1 Loop 1 Set 2 Loop 1 Set 3 Loop 1 Set 4 Loop 1 Set 5 Loop 2 Set 1 Loop 2 Set 2 Loop 2 Set 3 Loop 2 Set 4 Loop 2 Set 5	0	106/1/18 (6A/1/12) 106/1/26 (6A/1/1A) 106/1/34 (6A/1/22) 106/1/42 (6A/1/2A) 106/1/50 (6A/1/32) 106/2/18 (6A/2/12) 106/2/26 (6A/2/1A) 106/2/34 (6A/2/22) 106/2/42 (6A/2/2A) 106/2/50 (6A/2/32)	677-678 693-694 709-710 725-726 741-742 797-798 813-814 829-830 845-846 861-862	DINT	R/W
Cool (Direct) Propband Set the cool (direct) proportional band in process units.	Multiple PID Loop {1 or 2} Configuration	1,000 to 999,000 (/1000)	Loop 1 Set 1 Loop 1 Set 2 Loop 1 Set 3 Loop 1 Set 4 Loop 1 Set 5 Loop 2 Set 1 Loop 2 Set 2 Loop 2 Set 3 Loop 2 Set 4 Loop 2 Set 5	25,000	106/1/23 (6A/1/17) 106/1/31 (6A/1/1F) 106/1/39 (6A/1/27) 106/1/47 (6A/1/2F) 106/1/47 (6A/1/2F) 106/2/23 (6A/2/17) 106/2/31 (6A/2/1F) 106/2/39 (6A/2/27) 106/2/47 (6A/2/2F) 106/2/55 (6A/2/37)	687-688 703-704 719-720 735-736 751-752 807-808 823-824 839-840 855-856 871-872	DINT	R/W
Cool (Direct) Integral Set the cool (direct) integral in minutes per repeat.	Multiple PID Loop {1 or 2} Configuration	0 to 99,990 (/1000)	Loop 1 Set 1 Loop 1 Set 2 Loop 1 Set 3 Loop 1 Set 4 Loop 1 Set 5 Loop 2 Set 1 Loop 2 Set 2 Loop 2 Set 3 Loop 2 Set 4 Loop 2 Set 5	0	106/1/24 (6A/1/18) 106/1/32 (6A/1/20) 106/1/40 (6A/1/28) 106/1/48 (6A/1/30) 106/1/56 (6A/1/38) 106/2/24 (6A/2/18) 106/2/32 (6A/2/20) 106/2/40 (6A/2/28) 106/2/48 (6A/2/30) 106/2/56 (6A/2/38)	689-690 705-706 721-722 737-738 753-754 809-810 825-826 841-842 857-858 873-874	DINT	R/W
Cool (Direct) Derivative Set the cool (direct) derivative time in minutes.	Multiple PID Loop {1 or 2} Configuration	0 to 9,990 (/1000)	Loop 1 Set 1 Loop 1 Set 2 Loop 1 Set 3 Loop 1 Set 4 Loop 1 Set 5 Loop 2 Set 1 Loop 2 Set 2 Loop 2 Set 3 Loop 2 Set 4 Loop 2 Set 5	0	106/1/25 (6A/1/19) 106/1/33 (6A/1/21) 106/1/41 (6A/1/29) 106/1/49 (6A/1/31) 106/1/57 (6A/1/39) 106/2/25 (6A/2/19) 106/2/33 (6A/2/21) 106/2/41 (6A/2/29) 106/2/49 (6A/2/31) 106/2/57 (6A/2/39)	691-692 707-708 723-724 739-740 755-756 811-812 827-828 843-844 859-860 875-876	DINT	R/W
Cool (Direct) Deadband Set the offset of the cool (direct) proportional band from set point in process units.	Multiple PID Loop {1 or 2} Configuration	1,000 to 999,000 (/1000)	Loop 1 Set 1 Loop 1 Set 2 Loop 1 Set 3 Loop 1 Set 4 Loop 1 Set 5 Loop 2 Set 1 Loop 2 Set 2 Loop 2 Set 3 Loop 2 Set 4 Loop 2 Set 5	0	106/1/22 (6A/1/16) 106/1/30 (6A/1/1E) 106/1/38 (6A/1/26) 106/1/46 (6A/1/2E) 106/1/54 (6A/1/36) 106/2/22 (6A/2/16) 106/2/30 (6A/2/1E) 106/2/38 (6A/2/26) 106/2/46 (6A/2/2E) 106/2/54 (6A/2/36)	685-686 701-702 717-718 733-734 749-750 805-806 821-822 837-838 853-854 869-870	DINT	R/W
Cross Over Point 1 Set value to switch from PID set 1 to PID set 2.	Multiple PID Loop {1 or 2} Configuration	-30,000,000 to 30,000,000 (/1000)	Loop 1 Loop 2	30,000,000	106/1/14 (6A/1/E) 106/2/14 (6A/2/E)	669-670 789-790	DINT	R/W
Cross Over Point 2 Set value to switch from PID set 2 to PID set 3.	Multiple PID Loop {1 or 2} Configuration	-30,000,000 to 30,000,000 (/1000)	Loop 1 Loop 2	30,000,000	106/1/15 (6A/1/F) 106/2/15 (6A/2/F)	671-672 791-792	DINT	R/W

Name and Description	Web Page	Range (Scaling)	Iterations	Default	EIP Decimal (Hex)	Modbus	EIP Data Type	Access
Cross Over Point 3 Set value to switch from PID set 3 to PID set 4.	Multiple PID Loop {1 or 2} Configuration	-30,000,000 to 30,000,000 (/1000)	Loop 1 Loop 2	30,000,000	106/1/16 (6A/1/10) 106/2/16 (6A/2/10)	673-674 793-794	DINT	R/W
Cross Over Point 4 Set value to switch from PID set 4 to PID set 5.	Multiple PID Loop {1 or 2} Configuration	-30,000,000 to 30,000,000 (/1000)	Loop 1 Loop 2	30,000,000	106/1/17 (6A/1/11) 106/2/17 (6A/2/11)	675-675 795-796	DINT	R/W
Device Configuration > Outputs > Output {1 to 4}								
Output Function Select the function of the output.	Output {1 to 4} Configuration	Off (0) Control (1) Event (2) Retransmit (3) (Outputs 1 and 3 only)	Output 1 Output 2 Output 3 Output 4	Off (0)	104/1/1 (68/1/1) 104/2/1 (68/2/1) 104/3/1 (68/3/1) 104/4/1 (68/4/1)	391 431 461 501	UINT	R/W
Output Direction Select whether the output will perform heating (indirect action) or cooling (direct action).	Output {1 to 4} Configuration	Off (0) Heat/Indirect (1) Cool/Direct (2)	Output 1 Output 2 Output 3 Output 4	Off (0)	104/1/6 (68/1/6) 104/2/6 (68/2/6) 104/3/6 (68/3/6) 104/4/6 (68/4/6)	398 438 468 508	UINT	R/W
Control Source Set which loop will control the output.	Output {1 to 4} Configuration	Loop 1 (0) Loop 2 (1)	Output 1 Output 2 Output 3 Output 4	Loop 1 (0)	104/1/3 (68/1/3) 104/2/3 (68/2/3) 104/3/3 (68/3/3) 104/4/3 (68/4/3)	393 433 463 503	UINT	R/W
Output Cycle Time Set the cycle time in seconds.	Output {1 to 4} Configuration	1 to 600 (/10) 0.1 to 60 seconds for non-mechanical relay outputs 1.0 to 60 seconds for mechanical relay outputs	Output 1 Output 2 Output 3 Output 4	1.0 second for non-mechanical relay outputs 10.0 seconds for mechanical relay outputs	104/1/2 (68/1/2) 104/2/2 (68/2/2) 104/3/2 (68/3/2) 104/4/2 (68/4/2)	392 432 462 502	INT	R/W
Output Mode Time Base Select whether the output will operate with a fixed or variable time-based control.	Output {1 to 4} Configuration	Fixed (0) Variable (1)	Output 1 Output 2 Output 3 Output 4	Fixed (0)	104/1/4 (68/1/4) 104/2/4 (68/2/4) 104/3/4 (68/3/4) 104/4/4 (68/4/4)	396 436 466 506	UINT	R/W
System Line Frequency Specify the line frequency to use if zero cross line frequency detection fails.	Output {1 to 4} Configuration	50 Hz (0) 60 Hz (1)		60 Hz (1)	108/1/31 (6C/1/1F)	1075	UINT	R/W
Low Power Scale Set the minimum percent value for the output.	Output {1 to 4} Configuration	0 to 10,000 (/1000)	Output 1 Output 2 Output 3 Output 4	0	104/1/24 (68/1/18) 104/2/24 (68/2/18) 104/3/24 (68/3/18) 104/4/24 (68/4/18)	418-419 449-450 488-489 519-520	DINT	R/W
High Power Scale Set the maximum percent value for the output.	Output {1 to 4} Configuration	0 to 10,000 (/1000)	Output 1 Output 2 Output 3 Output 4	10,000	104/1/25 (68/1/19) 104/2/25 (68/2/19) 104/3/25 (68/3/19) 104/4/25 (68/4/19)	420-421 451-452 490-491 521-522	DINT	R/W
Analog Signal Select analog output type.	Output {1 to 4} Configuration	Voltage (0) Current (1)	Output 1 Output 3	Voltage (0)	104/1/19 (68/1/13) 104/3/19 (68/3/13)	409 479	UINT	R/W
Low Voltage Scale Set the voltage value that corresponds to the Low Power Scale value.	Output {1 to 4} Configuration	0 to 10,000 (/1000)	Output 1 Output 3	0	104/1/22 (68/1/16) 104/3/22 (68/3/16)	414-415 484-485	DINT	R/W
High Voltage Scale Set the voltage value that corresponds to the High Power Scale value.	Output {1 to 4} Configuration	0 to 10,000 (/1000)	Output 1 Output 3	10,000	104/1/23 (68/1/17) 104/3/23 (68/3/17)	416-417 486-487	DINT	R/W
Low Current Scale Set the current value that corresponds to the Low Power Scale value.	Output {1 to 4} Configuration	0 to 20,000 (/1000)	Output 1 Output 3	4,000	104/1/20 (68/1/14) 104/3/20 (68/3/14)	410-411 480-481	DINT	R/W
High Current Scale Set the current value that corresponds to the High Power Scale value.	Output {1 to 4} Configuration	0 to 20,000 (/1000)	Output 1 Output 3	20,000	104/1/21 (68/1/15) 104/3/21 (68/3/15)	412-413 482-483	DINT	R/W

Name and Description	Web Page	Range (Scaling)	Iterations	Default	EIP Decimal (Hex)	Modbus	EIP Data Type	Access
Retransmit: Source Select the source the output will restransmit.	Output {1 to 4} Configuration	Process Value 1 (0) Process Value 2 (2) Set Point 1 (1) Set Point 2 (3)	Output 1 Output 3	Process Value 1 (0)	104/1/26 (68/1/1A) 104/3/26 (68/3/1A)	422 492	UINT	R/W
Retransmit: Low Scale Set the value that corresponds to the low value of the retransmit signal.	Output {1 to 4} Configuration	-30,000,000 to 30,000,000 (/1000)	Output 1 Output 3	-30,000,000	104/1/27 (68/1/1B) 104/3/27 (68/3/1B)	423-424 493-494	DINT	R/W
Retransmit: High Scale Set the value that corresponds to the high value of the retransmit signal.	Output {1 to 4} Configuration	-30,000,000 to 30,000,000 (/1000)	Output 1 Output 3	30,000,000	104/1/28 (68/1/1C) 104/3/28 (68/3/1C)	425-426 495-496	DINT	R/W
Retransmit: Offset Set the offset value for the retransmit signal.	Output {1 to 4} Configuration	-9,999,000 to 9,999,000 (/1000)	Output 1 Output 3	0	104/1/29 (68/1/1D) 104/3/29 (68/3/1D)	427-428 497-498	DINT	R/W
Output Source: Alarm 1 Enable Alarm 1 to trigger the output.	Output {1 to 4} Configuration	No (0) Yes (1)	Output 1 Output 2 Output 3 Output 4	No (0)	104/1/8 (68/1/8) 104/2/8 (68/2/8) 104/3/8 (68/3/8) 104/4/8 (68/4/8)	400 440 470 510	UINT	R/W
Output Source: Alarm 2 Enable Alarm 2 to trigger the output.	Output {1 to 4} Configuration	No (0) Yes (1)	Output 1 Output 2 Output 3 Output 4	No (0)	104/1/9 (68/1/9) 104/2/9 (68/2/9) 104/3/9 (68/3/9) 104/4/9 (68/4/9)	401 441 471 511	UINT	R/W
Output Source: Alarm 3 Enable Alarm 3 to trigger the output.	Output {1 to 4} Configuration	No (0) Yes (1)	Output 1 Output 2 Output 3 Output 4	No (0)	104/1/10 (68/1/A) 104/2/10 (68/2/A) 104/3/10 (68/3/A) 104/4/10 (68/4/A)	402 442 472 512	UINT	R/W
Output Source: Alarm 4 Enable Alarm 4 to trigger the output.	Output {1 to 4} Configuration	No (0) Yes (1)	Output 1 Output 2 Output 3 Output 4	No (0)	104/1/11 (68/1/B) 104/2/11 (68/2/B) 104/3/11 (68/3/B) 104/4/11 (68/4/B)	403 443 473 513	UINT	R/W
Output Source: Alarm 5 Enable Alarm 5 to trigger the output.	Output {1 to 4} Configuration	No (0) Yes (1)	Output 1 Output 2 Output 3 Output 4	No (0)	104/1/12 (68/1/C) 104/2/12 (68/2/C) 104/3/12 (68/3/C) 104/4/12 (68/4/C)	404 444 474 514	UINT	R/W
Output Source: Alarm 6 Enable Alarm 6 to trigger the output.	Output {1 to 4} Configuration	No (0) Yes (1)	Output 1 Output 2 Output 3 Output 4	No (0)	104/1/13 (68/1/D) 104/2/13 (68/2/D) 104/3/13 (68/3/D) 104/4/13 (68/4/D)	405 445 475 515	UINT	R/W
Output Source: Alarm 7 Enable Alarm 7 to trigger the output.	Output {1 to 4} Configuration	No (0) Yes (1)	Output 1 Output 2 Output 3 Output 4	No (0)	104/1/14 (68/1/E) 104/2/14 (68/2/E) 104/3/14 (68/3/E) 104/4/14 (68/4/E)	406 446 476 516	UINT	R/W
Output Source: Alarm 8 Enable Alarm 8 to trigger the output.	Output {1 to 4} Configuration	No (0) Yes (1)	Output 1 Output 2 Output 3 Output 4	No (0)	104/1/15 (68/1/F) 104/2/15 (68/2/F) 104/3/15 (68/3/F) 104/4/15 (68/4/F)	407 447 477 517	UINT	R/W
Output Source: Digital Input 3 Enable Digital Input 3 to trigger this output.	Output {1 to 4} Configuration	No (0) Yes (1)	Output 1 Output 2 Output 3 Output 4	No (0)	104/1/16 (68/1/10) 104/2/16 (68/2/10) 104/3/16 (68/3/10) 104/4/16 (68/4/10)	429 453 499 523	UINT	R/W
Output Source: Digital Input 4 Enable Digital Input 4 to trigger this output.	Output {1 to 4} Configuration	No (0) Yes (1)	Output 1 Output 2 Output 3 Output 4	No (0)	104/1/17 (68/1/11) 104/2/17 (68/2/11) 104/3/17 (68/3/11) 104/4/17 (68/4/11)	430 454 500 524	UINT	R/W

Name and Description	Web Page	Range (Scaling)	Iterations	Default	EIP Decimal (Hex)	Modbus	EIP Data Type	Access
Output Logic Operator Select the logic operation to determine the event output status.	Output {1 to 4} Configuration	And (0) Or (1)	Output 1 Output 2 Output 3 Output 4	And (0)	104/1/7 (68/1/7) 104/2/7 (68/2/7) 104/3/7 (68/3/7) 104/4/7 (68/4/7)	399 439 469 509	UINT	R/W
Output Active State Select the output state when an alarm condition is true.	Output {1 to 4} Configuration	Energized (0) De-Energized (1)	Output 1 Output 2 Output 3 Output 4	Energized (0)	104/1/18 (68/1/12) 104/2/18 (68/2/12) 104/3/18 (68/3/12) 104/4/18 (68/4/12)	408 448 478 518	UINT	R/W
Output State Indicates the state of the output.		Inactive (0) Active (1)	Output 1 Output 2 Output 3 Output 4	Inactive (0)	104/1/5 (68/1/5) 104/2/5 (68/2/5) 104/3/5 (68/3/5) 104/4/5 (68/4/5)	397 437 467 507	UINT	R
Device Configuration > Alarms > Alarm {1 to 8}								
Alarm Type Select the type of alarm. A process alarm responds when the temperature crosses a fixed value. A deviation alarm responds when the termperature deviates from the controlled setpoint by the Alarm Deviation Set Point.	Alarm {1 to 8} Configuration	Off (0) Low Process (1) High Process (2) Low Deviation (3) High Deviation (4) Low CT (5) High CT (6)	Alarm 1 Alarm 2 Alarm 3 Alarm 4 Alarm 5 Alarm 6 Alarm 7 Alarm 8	Off (0)	105/1/1 (69/1/1) 105/2/1 (69/2/1) 105/3/1 (69/3/1) 105/4/1 (69/4/1) 105/5/1 (69/5/1) 105/6/1 (69/6/1) 105/7/1 (69/7/1) 105/8/1 (69/8/1)	531 545 559 573 587 601 615 629	UINT	R/W
Process Alarm Source Select which process value the alarm will monitor.	Alarm {1 to 8} Configuration	Process Value 1 (0) Process Value 2 (1)	Alarm 1 Alarm 2 Alarm 3 Alarm 4 Alarm 5 Alarm 6 Alarm 7 Alarm 8	Process Value 1 (0)	105/1/2 (69/1/2) 105/2/2 (69/2/2) 105/3/2 (69/3/2) 105/4/2 (69/4/2) 105/5/2 (69/5/2) 105/6/2 (69/6/2) 105/7/2 (69/7/2) 105/8/2 (69/8/2)	532 546 560 574 588 602 616 630	UNIT	R/W
Process Alarm Set Point Set the temperature or process value that will trigger the alarm.	Alarm {1 to 8} Configuration	-30,000,000 to 30,000,000 (/1000)	Alarm 1 Alarm 2 Alarm 3 Alarm 4 Alarm 5 Alarm 6 Alarm 7 Alarm 8	0	101/1/49 (65/1/31) 101/1/55 (65/1/37) 101/1/61 (65/1/3D) 101/1/67 (65/1/43) 101/1/73 (65/1/49) 101/1/79 (65/1/4F) 101/1/85 (65/1/55) 101/1/91 (65/1/5B)	106-107 119-120 132-133 145-146 158-159 171-172 184-185 197-198	DINT	R/W
Deviation From Loop Select which set point the alarm will monitor.	Alarm {1 to 8} Configuration	Loop 1 (0) Loop 2 (1)	Alarm 1 Alarm 2 Alarm 3 Alarm 4 Alarm 5 Alarm 6 Alarm 7 Alarm 8	Loop 1 (0)	105/1/3 (69/1/3) 105/2/3 (69/2/3) 105/3/3 (69/3/3) 105/4/3 (69/4/3) 105/5/3 (69/5/3) 105/6/3 (69/6/3) 105/7/3 (69/7/3) 105/8/3 (69/8/3)	533 547 561 575 589 603 617 631	UINT	R/W
Deviation Alarm Set Point Set the deviation from the set point that will trigger an alarm.	Alarm {1 to 8} Configuration	-30,000,000 to 30,000,000 (/1000)	Alarm 1 Alarm 2 Alarm 3 Alarm 4 Alarm 5 Alarm 6 Alarm 7 Alarm 8	1	101/1/48 (65/1/30) 101/1/54 (65/1/36) 101/1/60 (65/1/3C) 101/1/66 (65/1/42) 101/1/72 (65/1/48) 101/1/78 (65/1/4E) 101/1/84 (65/1/54) 101/1/90 (65/1/5A)	104-105 117-118 130-131 143-144 156-157 169-170 182-183 195-196	DINT	R/W

Name and Description	Web Page	Range (Scaling)	Iterations	Default	EIP Decimal (Hex)	Modbus	EIP Data Type	Access
Current Transformer Measurement Input Select which current transformer input value this alarm will monitor.	Alarm {1 to 8} Configuration	Off (0) CT Input 3 (2) CT Input 4 (3)	Alarm 1 Alarm 2 Alarm 3 Alarm 4 Alarm 5 Alarm 6 Alarm 7 Alarm 8	CT Input 4 (3)	105/1/4 (69/1/4) 105/2/4 (69/2/4) 105/3/4 (69/3/4) 105/4/4 (69/4/4) 105/5/4 (69/5/4) 105/6/4 (69/6/4) 105/7/4 (69/7/4) 105/8/4 (69/8/4)	534 548 562 576 590 604 618 632	UINT	R/W
Current Transformer Alarm Set Point Set the value that will trigger this alarm	Alarm {1 to 8} Configuration	-30,000,000 to 30,000,000 (/1000)	Alarm 1 Alarm 2 Alarm 3 Alarm 4 Alarm 5 Alarm 6 Alarm 7 Alarm 8	0	101/1/50 (65/1/32) 101/1/56 (65/1/38) 101/1/62 (65/1/3E) 101/1/68 (65/1/44) 101/1/74 (65/1/4A) 101/1/80 (65/1/50) 101/1/86 (65/1/56) 101/1/92 (65/1/5C)	108-109 121-122 134-135 147-148 160-161 173-174 186-187 199-200	DINT	R/W
Send Email Select to enable an email to be sent on activation of alarm 1.	Alarm {1 to 8} Configuration	No (0) Yes (1)	Alarm 1 Alarm 2 Alarm 3 Alarm 4 Alarm 5 Alarm 6 Alarm 7 Alarm 8	No (0)	Web page only	Web page only		
Email Subject Enter a subject for the alarm email.	Alarm {1 to 8} Configuration	30 characters	Alarm 1 Alarm 2 Alarm 3 Alarm 4 Alarm 5 Alarm 6 Alarm 7 Alarm 8	0	Web page only	Web page only		
Alarm Hysteresis Set how far the process value must return into the normal operating range for an alarm to clear.	Alarm {1 to 8} Configuration	0 to 30,000,000 (/1000)	Alarm 1 Alarm 2 Alarm 3 Alarm 4 Alarm 5 Alarm 6 Alarm 7 Alarm 8	3,000	105/1/8 (69/1/8) 105/2/8 (69/2/8) 105/3/8 (69/3/8) 105/4/8 (69/4/8) 105/5/8 (69/5/8) 105/6/8 (69/6/8) 105/7/8 (69/7/8) 105/8/8 (69/8/8)	539-540 553-554 567-568 581-582 595-596 609-610 623-624 637-638	DINT	R/W
Latching Select whether this alarm will be latched, which requires that it be cleared manually after the process value returns to the normal range.	Alarm {1 to 8} Configuration	No (0) Yes (1)	Alarm 1 Alarm 2 Alarm 3 Alarm 4 Alarm 5 Alarm 6 Alarm 7 Alarm 8	No (0)	105/1/7 (69/1/7) 105/2/7 (69/2/7) 105/3/7 (69/3/7) 105/4/7 (69/4/7) 105/5/7 (69/5/7) 105/6/7 (69/6/7) 105/7/7 (69/7/7) 105/8/7 (69/8/7)	538 552 566 580 594 608 622 636	UINT	R/W

Name and Description	Web Page	Range (Scaling)	Iterations	Default	EIP Decimal (Hex)	Modbus	EIP Data Type	Access
Silencing Select whether to allow the operator to disable the alarm output before the process value returns to normal.	Alarm {1 to 8} Configuration	No (0) Yes (1)	Alarm 1 Alarm 2 Alarm 3 Alarm 4 Alarm 5 Alarm 6 Alarm 7 Alarm 8	No (0)	105/1/6 (69/1/6) 105/2/6 (69/2/6) 105/3/6 (69/3/6) 105/4/6 (69/4/6) 105/5/6 (69/5/6) 105/6/6 (69/6/6) 105/7/6 (69/7/6) 105/8/6 (69/8/6)	537 551 565 579 593 607 621 635	UINT	R/W
Blocking Select to block this alarm until the process value enters the normal range after turning the power on or after a set point change.	Alarm {1 to 8} Configuration	Off (0) Set Point Change (1) Power On (2) Set Point Change and Power On (3)	Alarm 1 Alarm 2 Alarm 3 Alarm 4 Alarm 5 Alarm 6 Alarm 7 Alarm 8	Off (0)	105/1/5 (69/1/5) 105/2/5 (69/2/5) 105/3/5 (69/3/5) 105/4/5 (69/4/5) 105/5/5 (69/5/5) 105/6/5 (69/6/5) 105/7/5 (69/7/5) 105/8/5 (69/8/5)	536 550 564 578 592 606 620 634	UINT	R/W
Device Configuration > Network > Email								
SMTP Server IP Resolution Specify the method to determine the SMTP server.	Device Configuration Network Email	Server Name (0) Fixed Address (1)		Server Name (0)	Web page only	Web page only		R/W
SMTP Server Name Specify the SMTP server name.	Device Configuration Network Email			0	Web page only	Web page only		R/W
SMTP Server Fixed Address Specify the SMTP server's fixed IP address.	Device Configuration Network Email	-2,147,483,647 to 2,147,483,647		-1,062,731,775	Web page only	Web page only		R/W
Source Email Address Specify the return source of submitted email. This source is included in sent emails.	Device Configuration Network Email			0	Web page only	Web page only		R/W
Email Recipient {1 to 4} Specify an email recipient. Up to four mail boxes may receive an email.	Device Configuration Network Email			0	Web page only	Web page only		R/W
Device Configuration > Data Logging > Settings								
Data Logging Enable or disable data logging.	Datalog Configuration	No (0) Yes (1)		No (0)	107/1/20 (6B/1/14)	1209	UINT	R/W
Parameters to Data Log: Process Value {1 to 4} Specify whether to include the corresponding process value in the datalog.	Datalog Configuration	No (0) Yes (1)	Process Value 1 Process Value 2 Process Value 3 Process Value 4	No (0)	107/1/2 (6B/1/2) 107/1/3 (6B/1/3) 107/1/4 (6B/1/4) 107/1/5 (6B/1/5)	1191 1192 1193 1194	UINT	R/W
Parameters to Data Log: Working Set Point {1 or 2} Specify to whether to include the corresponding set point in the datalog.	Datalog Configuration	No (0) Yes (1)	Set Point 1 Set Point 2	No (0)	107/1/6 (6B/1/6) 107/1/6 (6B/1/6)	1195 1196	UINT	R/W
Parameters to Data Log: Loop Power {1 or 2} Specify whether to include the corresponding power output in the datalog.	Datalog Configuration	No (0) Yes (1)	Loop 1 Loop 2	No (0)	107/1/10 (6B/1/A) 107/1/11 (6B/1/B)	1199 1200	UINT	R/W
Parameters to Data Log: {Digital or CT} Input {3 or 4} Status Specify whether to include the corresponding digital input status in the datalog.	Datalog Configuration	No (0) Yes (1)	Digital or CT Input 3 Digital or CT Input 4	No (0)	107/1/8 (6B/1/8) 107/1/9 (6B/1/9)	1197 1198	UINT	R/W

Name and Description	Web Page	Range (Scaling)	Iterations	Default	EIP Decimal (Hex)	Modbus	EIP Data Type	Access
Parameters to Data Log: Alarm {1 to 8} Status Specify to whether to include the corresponding alarm status in the datalog.	Datalog Configuration	No (0) Yes (1)	Alarm 1 Alarm 2 Alarm 3 Alarm 4 Alarm 5 Alarm 6 Alarm 7 Alarm 8	No (0)	107/1/11 (6B/1/C) 107/1/12 (6B/1/D) 107/1/13 (6B/1/E) 107/1/14 (6B/1/F) 107/1/15 (6B/1/10) 107/1/16 (6B/1/11) 107/1/17 (6B/1/12) 107/1/18 (6B/1/13)	1201 1202 1203 1204 1205 1206 1207 1208	UINT	R/W
Logging Interval Specify the timed interval of datalog updates.	Datalog Configuration	1,000 to 200,000 (/1000)		1,000	107/1/1 (6B/1/1)	1189-1190	DINT	R/W
Logging Interval Units Specify the units for the data logging interval.	Datalog Configuration	Seconds (0) Minutes (1)		Seconds (0)	107/1/22 (6B/1/16)	1211	UINT	R/W
Logging Data Compression Enable compression of datalog files.	Datalog Configuration	No (0) Yes (1)		No (0)	107/1/23 (6B/1/17)	1218	UINT	R/W
When Log File is Full Specify the action to be taken when the datalog file is full.	Datalog Configuration	Overwrite (0) Stop logging (1)		Overwrite (0)	Web page only	Web page only		
Write Log File to TFTP Server Enable automatic transfer of datalog files to the TFTP server.	Datalog Configuration	No (0) Yes (1)		No (0)	Web page only	Web page only		
TFTP Server Name Enter the name of the TFTP server to which datalog files will be transferred.	Datalog Configuration				Web page only	Web page only		
TFTP Server Fixed Address Enter the IP address of the TFTP server to which datalog files will be transferred.	Datalog Configuration	-2,147,483,647 to 2,147,483,647		-1,062,731,775	Web page only	Web page only		
Delete All Datalog Files Select to clear the current datalog file.	Datalog Configuration	No (0) Yes (1)		No (0)	107/1/21 (6B/1/15)	1210	UINT	R/W
TFTP Transfer Interval Specify the time interval of data transfers to the TFTP server.	Datalog Configuration	1 to 999		60	Web page only	Web page only		R/W
Device Configuration > Datalogging > Clock								
Current Time: Hours Specify the hours portion of the time.	Clock Configuration	1 to 12		1	108/1/50 (6C/1/32)	1212	INT	R/W
Current Time: Minutes Specify the minutes portion of the time.	Clock Configuration	0 to 59		0	108/1/51 (6C/1/33)	1213	INT	R/W
Current Time: Seconds Specify the seconds portion of time.	Clock Configuration	0 to 59		0	108/1/52 (6C/1/34)	1214	INT	R/W
Current Time: 12 Hour Meridien Specify AM or PM.	Clock Configuration	A.M. P.M.		A.M.	Web page only	Web page only		R/W
Time Zone Specify the time zone.	Clock Configuration	Up to four alpha characters		0	Web page only	Web page only		R/W
Current Date: Month Specify the month portion of the date.	Clock Configuration	1 to 12		1	108/1/53 (6C/1/35)	1215	INT	R/W
Current Date: Day Specify the day of the month portion of date	Clock Configuration	1 to 31		1	108/1/54 (6C/1/36)	1216	INT	R/W
Current Date: Year Specify the year portion of the date	Clock Configuration	2000 to 2099		2003	108/1/55 (6C/1/37)	1217	INT	R/W
Synchronize Clock With Time Server Enable the real time clock to automatically synchronize with a time server.	Clock Configuration	No (0) Yes (1)		No (0)	Web page only	Web page only		R/W
Time Server IP Resolution Specify the method for assigning the clock server IP address.	Clock Configuration	DHCP Server Name Fixed Address		DHCP	Web page only	Web page only		R/W

Name and Description	Web Page	Range (Scaling)	Iterations	Default	EIP Decimal (Hex)	Modbus	EIP Data Type	Access
Time Server Name Specify the real time server name.	Clock Configuration			0	Web page only	Web page only		R/W
Time Server Fixed Address. Specify a fixed IP address for the time server.	Clock Configuration	-2,147,483,647 to 2,147,483,647		1	Web page only	Web page only		R/W
Device Information								
Universal Input {1 or 2} Type Displays the type of hardware present for the corresponding analog input.	Device Information	None (0) Universal (1)	Analog Input 1 Analog Input 2	Universal (1) None (0)	108/1/17 (6C/1/11) 108/1/18 (6C/1/12)	1043 1044	UINT	R
Digital Input {3 or 4} Type Displays the type or hardware present for the corresponding digital input.	Device Information	None (0) Dry Contact (1)	Digital Input 3 Digital Input 4	None (0)	108/1/21 (6C/1/15) 108/1/22 (6C/1/16)	1047 1048	UINT	R
Current Transformer Input {3 or 4} Type Displays the type of hardware present for the corresponding analog input.	Device Information	None (0) Current Transformer (2)	CT Input 3 CT Input 4	None (0)	108/1/19 (6C/1/13) 108/1/20 (6C/1/14)	1045 1046	UINT	R
Measured System Line Frequency Display the measured line frequency.	Device Information	0 to 32,767		60	108/1/32 (6C/1/20)	1076	INT	R
Part Number Indicates the controller's part number.	Device Information			12	Web page only	Web page only		R/W
MAC Address Indicates the MAC address of the controller.	Device Information	6 characters		0	246/1/3 (F6/1/3)	N/A	STRUCT of USINT[6]	R
Serial Number Indicates the controller's serial number.	Device Information	0 to 2000000200		0	100/1/6 (64/1/6)	7-8	DINT	R
Date Code Indicates the controller's date of manufacture.	Device Information	-2,147,483,647 to 2,147,483,647		0	100/1/7 (64/1/7)	9	DINT	R
Software Prototype Revision Indicates the firmware prototype version.	Device Information	0 to 32,767		0	100/1/10 (64/1/A)	12	INT	R
Software Released Revision Indicates the software revision.	Device Information	0 to 32,767		0	100/1/9 (64/1/9)	11	INT	R
Hardware - Net IP Resolution Specify the order of methods to try to set the the controller's IP address.	Configuration Network	DHCP, auto IP, fixed IP (0) DHCP, fixed IP (1) Auto IP, fixed IP (2) Fixed IP (3)		DHCP, auto IP, fixed IP (0)	Web page only	Web page only		R/W
Number of Analog Inputs Implemented Displays the number of analog inputs implemented.	Device Information	1 to 4		1	100/1/14 (64/1/E)	18	INT	R
Number of Digital Inputs Implemented Displays the number of digital inputs implemented.	Device Information	0 to 2		0	100/1/15 (64/1/F)	19	INT	R
Number of Outputs Implemented Displays the number of outputs implemented.	Device Information	1 to 4		1	100/1/16 (64/1/10)	20	INT	R
Number of Possible Analog Inputs Displays the total number of analog inputs available.	Device Information	1 to 4		1	Web page only	Web page only		R
Number of Possible Digital Inputs Displays the total number of digital inputs available.	Device Information	0 to 2		0	Web page only	Web page only		R
Number of Possible Outputs Displays the total number of outputs available.	Device Information	1 to 4		1	Web page only	Web page only		R
Output {1 to 4} Type Displays the type of hardware present for the corresponding output.	Device Information	None (0) Switched DC (1) SSR (2) Process (3) Form A Relay (4) Form C Relay (5)	Output 1 Output 2 Output 3 Output 4	Switched DC (1) None (0) None (0) None (0)	108/1/23 (6C/1/17) 108/1/24 (6C/1/18) 108/1/25 (6C/1/19) 108/1/26 (6C/1/1A)	1049 1050 1051 1052	UINT	R

Name and Description	Web Page	Range (Scaling)	Iterations	Default	EIP Decimal (Hex)	Modbus	EIP Data Type	Access
Analog Input {1 to 4} Counts Displays the A-to-D counts for the corresponding analog input.	Device Information	0 to 65,535	Analog Input 1 Analog Input 2 Analog Input 3 Analog Input 4	0	108/1/1 (6C/1/1) 108/1/2 (6C/1/2) 108/1/3 (6C/1/3) 108/1/4 (6C/1/4)	1001-1002 1003-1004 1005-1006 1007-1008	DINT	R
Analog Out {1 to 4} Process Value Displays the process output value for the corresponding output.	Device Information	-30,000,000 to 30,000,000 (/1000)	Analog Output 1 Analog Output 2 Analog Output 3 Analog Output 4	0	108/1/13 (6C/1/D) 108/1/14 (6C/1/E) 108/1/15 (6C/1/F) 108/1/16 (6C/1/10)	1023-1024 1025-1026 1027-1028 1029-1030	DINT	R
CJC Temperature {1 or 2} Displays the cold junction compensation temperature.	Device Information	32,000 to 167,000 (/1000)			108/1/9 (6C/1/9)	1015-1016	DINT	R
Firmware Build Indicates the firmware build number.		0 to 32767		0	100/1/11 (64/1/B)	13	INT	R
Number of Alarms Implemented Indicates the number of alarms implemented.		8 to 8		8	100/1/17 (64/1/11)	21	INT	R
Number of Control Loops Indicates the number of control loops.		1 to 2		1	100/1/18 (64/1/12)	22	INT	R
Bit Pattern 1		55 (hex)		55 (hex)	100/1/2 (64/1/2)	1	UINT	R
Bit Pattern 2		AA (hex)		AA (hex)	100/1/3 (64/1/3)	2	UINT	R
ASCII '12'		12 (ASCII)		12 (ASCII)	100/1/4 (64/1/4)	3	UINT	R
ASCII '34'		23 (ASCI)		23 (ASCI)	100/1/5 (64/1/5)	4	UINT	R
Firmware ID Indicates the firmware ID number.		0 to 32,767		0	100/1/8 (64/1/8)	10	INT	R
Firmware Branch Indicates the firmware branch number.		0 to 32,767		0	100/1/12 (64/1/C)	14	INT	R
Number of Alarms Possible Indicates the total number of alarms.		8 to 8		8	Web page only	Web page only		R
Number of Possible Control Loops Indicates the total number of control loops.		1 to 2		1	Web page only	Web page only		R
Number of PID Sets Possible Indicates the total number of PID sets per loop.		1 to 5		5	Web page only	Web page only		R
Number of PID Sets Implemented Indicates the number of PID sets implemented.		1 to 5		5	100/1/19 (64/1/13)	23	INT	R
Device Configuration > Network > TCP/IP Settings								
Device Name Specify the controller's name. The controller can be browsed using this name via NetBIOS.	Network Configuration	PDxxxxxx (last six digits of serial number) 2 characters per word in Modbus			108/1/49 (6C/1/31)	1179	SHORT_STRING	R
Current Settings: IP Address Indicates the current IP address.	Network Configuration	-2,147,483,647 to 2,147,483,647		1	245/1/5 (F5/1/5)		1st element of STRUCT of UDINT[5], STRING	R
Current Settings: Subnet Mask Indicates the current IP subnet mask.	Network Configuration	-2,147,483,647 to 2,147,483,647		1	245/1/5 (F5/1/5)		2nd element of STRUCT of UDINT[5], STRING	R
Current Settings: Default Gateway Indicates the current gateway IP address.	Network Configuration	-2,147,483,647 to 2,147,483,647		1	245/1/5 (F5/1/5)		3rd element of STRUCT of UDINT[5], STRING	R
Current Settings: DNS Server Indicates the current DNS server IP address.	Network Configuration	-2,147,483,647 to 2,147,483,647		1	245/1/5 (F5/1/5)		4th element of STRUCT of UDINT[5], STRING	R

Name and Description	Web Page	Range (Scaling)	Iterations	Default	EIP Decimal (Hex)	Modbus	EIP Data Type	Access
Fixed IP Address Specify the fixed IP address.	Network Configuration	-2,147,483,647 to 2,147,483,647		-1,062,731,775	Web page only	Web page only		R/W
Fixed Subnet Mask Specify the fixed subnet mask.	Network Configuration	-2,147,483,647 to 2,147,483,647		-65,536	Web page only	Web page only		R/W
Fixed Gateway Specify the fixed gateway IP address	Network Configuration	-2,147,483,647 to 2,147,483,647		-1,062,731,775	Web page only	Web page only		R/W
Fixed DNS Server Specify the fixed DNS server address.	Network Configuration	-2,147,483,647 to 2,147,483,647		-1,062,731,775	Web page only	Web page only		R/W
Device Always Name Indicates the name with which the controller can always be accessed via NetBIOS.	PDxxxxxx (last six digits of serial number)			0	Web page only	Web page only		R
Device Watlow Name Indicates the controller's Watlow name. The controller can be browsed using this name.	WATaa:bb:cc (last 3 numbers in MAC address)			0	Web page only	Web page only		R
Device Configuration > Network > Security								
User Name Enter the User Name for password protection of the page.	Network Configuration		Monitor Page Configuration Page Calibration Page	0	Web page only	Web page only		R/W
Password Enter the Password for access to the page.	Network Configuration		Monitor Page Configuration Page Calibration Page	0	Web page only	Web page only		R/W
Calibration								
Save User Settings Set Yes to save user settings to the EEPROM	Calibration	No (0) Yes (1)		No (0)	108/1/29 (6C/1/1D)	1061	UINT	R/W
EtherNet/IP Objects								
Device Type Indicates the EtherNet/IP device type for the controller.		0 to 0		0	1/1/2 (1/1/2)		UINT	R
Identity Object: Product Name					1/1/7 (1/1/7)		SHORT_STRING	R
Identity Object: Serial Number		0 to 2000000200			1/1/6 (1/1/6)		UDINT	R
Identity Object: Status		0 to 0		0	1/1/5 (1/1/5)		WORD	R
Number of O->T Dynamic Assembly Points		0 to 65,535			110/0/100 (6E/0/64)		UINT	R
Number of T->O Dynamic Assembly Points		0 to 65,535			109/0/100 (6D/0/64)		UINT	R
O->T Assembly Size in Bytes Indicates the size of the O->T assembley.		0 to 65,535			110/0/101 (6E/0/65)		UINT	R
O->T Dynamic Assembly Point {1 to 10} Read or write the class, instance, and attribute for each additional O->T assembly point.		0 to 2,147,483,647		0	110/1/1 (6E/1/1) 110/2/1 (6E/2/1) 110/3/1 (6E/3/1) 110/4/1 (6E/4/1) 110/5/1 (6E/5/1) 110/6/1 (6E/6/1) 110/7/1 (6E/7/1) 110/8/1 (6E/8/1) 110/9/1 (6E/9/1) 110/10/1 (6E/A/1)		STRUCT of USINT[3] (Class, Instance and Atttribute)	R/W
Product Code Indicates the EtherNet/IP product code for the controller.		200 to 200		200	1/1/3 (1/1/3)		UINT	R

Name and Description	Web Page	Range (Scaling)	Iterations	Default	EIP Decimal (Hex)	Modbus	EIP Data Type	Access
T -> O Dynamic Assembly Point {1 to 10} Read or write the class, instance, and attribute for each additional T->O assembly point.		0 to 2,147,483,647	Point 1 Point 2 Point 3 Point 4 Point 5 Point 6 Point 7 Point 8 Point 9 Point 10	0	109/1/1 (6D/1/1) 109/2/1 (6D/2/1) 109/3/1 (6D/3/1) 109/4/1 (6D/4/1) 109/5/1 (6D/5/1) 109/6/1 (6D/6/1) 109/7/1 (6D/7/1) 109/8/1 (6D/8/1) 109/9/1 (6D/9/1) 109/10/1 (6D/A/1)		STRUCT of USINT[3] (Class, Instance and Atttribute)	R/W
T->O Assembly Size in Bytes Indicates the size of the T->O assembley.		0 to 65,535			109/0/101 (6D/0/65)		UINT	R
Vendor ID Indicates the ODVA vendor ID for the controller.		153 to 153		153	1/1/1 (1/1/1)		UINT	R